

# Railroad Age Gazette

Including the Railroad Gazette and The Railway Age

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### THE RAILWAY "MELON."

With the return of prosperity the railway "melon" so-called is again becoming conspicuous in the investor's eye, sometimes the product of mere rumor, sometimes a realism, sometimes a pleasing vision on the edge of realism. Lackawanna shareholders have already, in effect, harvested a melon in the form of shares of the new collateral company, Central of New Jersey stockholders are better than hopeful, and forecasted melons of such great corporations as Pennsylvania and New York Central—and there are others—are reflected in the market prices of the stock. This new "melon" epoch is natural and logical as a result of what may be called, metaphorically, conditions of railway weather. The panic of 1907 and the stress and storms of 1908 were unfavorable to the melon crop and, indeed, to almost any form of new railway financing, much of which had to be postponed to a more sunny season. The new season seems at hand. Better earnings, gross and net, slow but steady decrease in the returns of unused cars, presidential election over, the new tariff fixed and, in general, prosperity winging upward, bring in their train the deferred or new financing in which the "melon" is more

or less sure to be a factor—and, in some respects and cases, a peril.

The railway "melon" has passed through two historical stages. The early days, or perhaps it is more accurate to say the mediaeval time of the melon, brought forth the fruit in the variety most luscious to the stockholder, a free distribution of new shares on which the old dividend rate was pretty sure to be continued, and the new melon, cut and distributed, to be a stimulant both of hope and appetite for other melons to come. Interrupted only by the panic and "long drag" from 1873 to 1878 the two or three decades following the civil war, midway between a kind of "pioneer" railway period and a later period of closer and more scientific railroading, were times when the pure railway melon in the form of the stock dividend—the watermelon so to speak—flourished. Within moderately easy memory of men not very old are the great New York Central and later Rock Island distributions. There was little or no check on such distribution by public sentiment and practically none by law. Theories of franchise value, of restraints on capitalization, of high powers of commissions were either non-existent or inchoate. But the most telling check of all on the absolute "melon" theory and practice, the absolute necessity for a railway's getting at least some price for its bounty, to the stockholder, was still in the future; and the melon was treated as a gift and not a bargain.

That old period of the railway melon as a gratuity is now almost completely in the past tense and we have entered fully on a new horticultural railway period. The melon is now a qualified fruit. It is cut in sections and not passed out as spheres or hemispheres. The stockholder may have his "rights," for sale or to be taken up, as the case may be, but they are generally small in value or, if big absolutely, are small in ratio to the value of the holding upon which they are based. There are public sentiment, law, rulings or policies of public commissions and of states to be reckoned with. The melon, too, has taken on a hybrid shape. It may connote the immediate stock or the remote stock resting upon contingencies in the form of the convertible bond, whose holder makes a kind of bet on the value of a convertibility more or less far away. The up-to-date theory of the melon, moreover, with railway improvement and extension ever expanding, is that as much as possible must be extracted from the stockholder consistent with leaving him enough of profit to "stay in" with his company. The idea of "what the traffic will bear" applies to the railway melon as, sometimes, to its rates. The old-fashioned melon was a bonus. The new melon, under changed railway conditions, is a form of barter between directorate and stockholder. And sometimes the directorate errs in its offer. It is not long since a vast volume of Pennsylvania "rights" went to the waste basket and since a stock issue of the New Haven, officially announced in the annual report, had to be transmuted into a 6 per cent. convertible bond.

The mutations and a certain sentimental status of the railway melon based on financial conditions are also interesting studies. In hard times the melon, in the vulgate of the street, is a bear; in prosperity a bull. "Rights" which in the old days used to send a stock up and sometimes kiting became palpably during the later months of 1907 and through most of 1908 an element of stock weakness. Often the report of them sent the stock down two or three times the selling value of the rights themselves when the rights came. They were interpreted as a symptom of corporate stress, an index of weakness rather than strength, and the analogue of the man whose credit is so infirm that he must pay a high rate for money. From that condition the railway melon is now, with the business revival, reacting toward its old character. The melon, even in its qualified nature as a form of money-raising and not a gift, is becoming a bull. The "right" in its embryonic form as a rumor of the market

sends the annexed stock up and not down. It reverses its nature and influence and is the coefficient of prosperity where before it was one of the deficients in adversity. In this sense the melon is become one of the most suggestive pointers on the temper of the market and of its hopes and fears as well as, in a still larger sense, a measure of railway recuperation.

But the new advent of the melon, in its normal and conventional shape, as a genuine profit for the time to the railway stockholder, has also its peril. It is sentimentally attractive. It makes the stockholder "feel good" and the railway director feels good when he makes the stockholder feel so; and, it must also be said that, as compared with the old-fashioned stock dividend, the new fashion of making the stockholder pay par or somewhat more for stock or convertible bonds quoted at a good premium is conservative; and, finally, the melon is a certain force of cohesion that binds a host of old stockholders together. But, on the other hand, the melon seldom, almost never, signifies the cheapest form of borrowing; particularly in the shape more and more common of a convertible bond it signifies a form of speculative value; and the practice of "bulling" a stock preliminary to rights is not one that rests on theory and vague rumor. The railway melon, to summarize its financial nature and quality, banks upon a prosperity which may or may not be realized and intermediately or remotely implies an abnormal borrowing rate whether from stockholders or the outside public. The most powerful railway companies may take the risk; with all others, which, from their very nature find it hard to establish selling values for rights, the melon policy is anything but conservative. Nor is a certain hue and cry of railway "rights" heard so generally in Wall street now, so soon after the trying experiences of a period of acute depression, entirely reassuring. These cries would seem more rational and less ominous to railway financiers if they came after a few years' of good times instead of coming at the present time, which may be called only the dawn.

#### TRANSCONTINENTAL FREIGHT RATES AGAIN.

In our issue of May 14 last we discussed at some length the transcontinental freight rate situation, and the article called forth from our readers a number of questions. The Interstate Commerce Commission is to give hearings in western cities this fall for the purpose of determining on a basis of readjustment, and it may be worth while to give some further consideration to certain points that have been mooted.

Certain commodities can be shipped all-rail from eastern points to Pacific coast terminals and back to inland points, such, for example, as Salt Lake City and Spokane, for less than is charged for hauling them from the East direct to these inland points; and commodities originating at inland points, such as Salt Lake City and Spokane, can be sent to the East cheaper by first sending them to a Pacific coast terminal than by shipping them direct. Why such unequal adjustments?

The situation has often been explained. On a commodity shipped from Pittsburgh to Salt Lake City, for example, the rate is perhaps a combination of the rate from Pittsburgh to Chicago plus the rate from Chicago to the Missouri river, plus the rate from the Missouri river to Salt Lake City. As a rule, the sum of these local rates is less than the sum of the rate from the East to the Pacific coast plus the local rate from the Pacific coast back to the inland point. But if the rail lines make a reduced through commodity rate to meet water competition it may happen that the new through rate from New York, or Pittsburgh, or Chicago to the coast plus the local rate back to Salt Lake City, for example, will be lower than the combination of the local rates direct to Salt Lake City. The transcontinental roads formerly had in their tariffs a "maximum" rule which provided that in no case would they

charge a rate to an inland point that was greater than the through rate from the East to the coast plus the local rate back, but the Interstate Commerce Commission held that this was an illegal way to publish a rate and the rule was eliminated. Now, there are thousands of commodities moving from thousands of points of origin to thousands of points of destination. There are constant changes in the through rates from the Atlantic seaboard to the Pacific coast and in the local rates to and from intermediate basing points. The rate which to-day makes lower on the Mississippi river or Chicago may to-morrow, owing to some change in a tariff, make lower on the coast. As soon as such an inconsistency in tariffs is detected by railway traffic men it is corrected, but no method of always protecting the lowest combination of rates has yet been devised which meets the approval of the Commission. Consequently, from time to time, it happens that some shrewd shipper discovers that he can ship to the coast and back to an inland point cheaper than he can ship direct to the inland point; and, in the phraseology of the traffic man, he "works the lower combination" until the railways correct their mistake.

As already stated, there are through all-rail rates from the Atlantic seaboard to the Pacific coast. There are also through water-and-rail rates from the Atlantic seaboard through the Atlantic and Gulf ports to western inland points. It will naturally be asked why through all-rail rates are not also made from the East to western inland points basing on Pacific coast terminals. The reason is this: The lines east of Chicago and the Mississippi river accept very low proportions on traffic destined to the Pacific coast. They do this because unless low rates are made to the coast the traffic will move by water. But traffic from the East to Colorado, Kansas, Nebraska, Utah, etc., cannot move by water—at least, not all the way. Consequently, the eastern roads refuse to unite with the western roads in making through all-rail rates to points in these and other interior western states, but insist on having their local rates, or proportional rates only slightly lower, to the upper Mississippi crossings. The stand of the eastern roads seems justifiable. Since they take this stand, the western roads naturally desire to maintain their local rates, also, for if they did not they would have to absorb all of the difference between the sum of the locals and any lower proportional rate that might be established. There is much talk about the local rates of the western roads being very high as compared with the proportions that they accept on through traffic to the coast. This difference results mainly from the condition referred to.

Many readers will say that while the foregoing helps to explain it does not justify the more prominent inequalities of the transcontinental rate system. Some shippers flatly take the position that the railways should not meet water competition. Among these is J. H. Johnston, traffic manager of the Oklahoma Traffic Association, from whom we published a letter in our issue of July 2. Mr. Johnston quoted with approval from a resolution adopted by the Federated Commercial Clubs of Oklahoma in which it was proposed that the Interstate Commerce Law be amended so as to provide that "rates made by railways to meet water competition shall not be exceeded at intermediate points, and that no higher rates per ton per mile shall be made by the same railway to points not intermediate, but where the cost of transportation is greater." Substantially similar views were expressed by F. W. Saward in a letter published in our issue of May 28. The effect of forbidding the railways to meet water competition would be revolutionary, and there would be no important advantage even to towns not having water transportation. Having raised these rates and lost the traffic the roads would have to get more out of the traffic to inland points; or at least the tendency would be to prevent reductions of the rates to inland points, while not affecting water rates.

There is a good illustration in another section of the country. The rates from the Atlantic seaboard to points in Kansas,



Oklahoma, etc., are now the sums of the local rates from the seaboard to the Mississippi river, from the Mississippi to the Missouri, and from the Missouri to destination. For several months a bitter rate war has been waging between rival coast steamship lines, in consequence of which the ocean rates from New York to Galveston have been sharply reduced. Owing to this the sum of the ocean rate from New York to Galveston plus the railway rail rate from Galveston to points in Kansas and other interior states has become less than the through all-rail rates from central and eastern territory to points in Kansas, Oklahoma, etc.; and shippers in cities such as Chicago, receivers in Kansas, Oklahoma and other western and south-western states, and the Kansas railway commission are demanding that the all-rail lines shall make rates to the Southwest to meet the competition of the water-and-rail lines. If the water-and-rail rates should permanently remain on their present basis the all-rail lines undoubtedly would meet them. But under the policy favored by the Oklahoma Traffic Association the all-rail lines would not be allowed to reduce rates to meet this competition without reducing other rates proportionately. They could not reduce other rates proportionately without seriously impairing their chances of earning a living. What they undoubtedly would do if the proposed policy were adopted—what they probably would have to do—would be to ignore the water competition and make good any losses of traffic and revenue they sustained through this policy by raising their rates to points not presenting water competition.

While places not having water transportation would be injured as much as or more than points having water transportation by a policy which, in effect, prohibited railways from meeting water competition, it does not follow that that policy will not be adopted. The public often is influenced more by superficial appearances than by underlying facts, conditions and economic laws. Superficially it seems unfair discrimination for a railway in any circumstances to haul a commodity a longer distance for a lower rate, or even to make the same rate for hauling it two different distances. Superficially, the only fair and logical scheme of rates is one that fixes the same rate per ton per mile on all commodities for all distances, with some allowance for terminal expenses. And it may be that the time is not far distant when the entire commerce of the United States will be stretched and broken on the Procrustean bed of rate schedules that take into consideration no factor but distance. We certainly seem to be moving rapidly in that direction. If that time comes it will be a sorry one for the commerce and industry of the country. The railways can stand it, probably, as well as the public—with the difference, however, that the railways can explain their position and can clearly set forth the reasons which actuate them, whereas the public has only a hazy notion of its needs and cannot formulate its philosophy.

#### BROWN'S DISCIPLINE.

The recent abolition of suspensions in the train service of the Chicago, Burlington & Quincy (*Railroad Age Gazette* May 7 and June 25) called attention to the fact that little or nothing had been published about "Brown's discipline" for several years, and we have made inquiries of a number of roads concerning their experience with it. The substance of the reply received from the Harriman Lines is given on another page, chiefly in the shape of a statistical table. The larger tables of which this is a summary, give significant evidence that the roads represented are reaping the benefit of at least one of the important features of the non-suspending system of discipline—the keeping of accurate records of all punitive discipline and arranging them for comparison; while a single item in the table—that which shows that no man was disciplined times enough to indicate that he ought to

be dismissed (item No. 17)—seems to indicate that the Harriman Lines, like many others, tolerate the characteristic weakness of the system—the practice of continuing leniency too far. To "suspend" a careless or malicious employee 30 "days" on a book, instead of actually taking him out of the service for a month and cutting off his pay, seems to the average railway officer like unexampled leniency and—at least this was so in the beginning—he has had to wrench his feelings and his long settled habits pretty severely in order to do such an apparently illogical thing. But, once having set out to adopt the distasteful custom, to please his superior, he has lost his grit, and has lazily assumed that "record discipline" can run itself. If left to run itself it soon degenerates into a subject for ridicule. This, we say, is what has been done by the "average" officer. Of course, many superintendents are better than the average, and this criticism does not apply.

The record before us, we say, *seems* to indicate undue leniency. We do not know. It may be that all men who ought to be discharged were discharged, for some specific offense, before their demerit records piled up. We should be glad to learn that such was the case. Further investigation by Mr. Rowe will, no doubt, throw light on this point. Whatever the actual conditions, Mr. Kruttschnitt and his assistants are making a more thorough and intelligent study of this subject than we have heard of elsewhere, and for that the railway world is indebted to them.

Speaking of the Brown system generally we can record no marked change.\* Managers who have it in use are firm in their conviction that it is the only equitable method. One who has just replied to our inquiry summarizes succinctly in the sentence, "Any employee who cannot be sufficiently disciplined [punished] without having his wages cut off ought to be dismissed."

But we do not get much that is definite concerning actual practice. The manager, no matter how high his ideals, is dependent on his superintendents for the execution of those ideals, and we do not find anyone who has critically compared one road or one set of superintendents with another, or who will give us an illuminating estimate of the efficiency of his own discipline as compared with any definite standard.

On the other hand, the manager who doggedly clings to his prerogative of punishing by suspension gives no facts to support his view, except that (as he insists) the severity of the old system is a necessity; that often there is nothing else that will answer. And he makes fun of the soft and loose methods of those who do not suspend. It is true that many men on many roads do not adequately appreciate generous treatment; but it seems to us that every officer who finds this among his troubles must admit that he has a duty either to reform or to remove that kind of employee. We do not belittle the difficulty of carrying out this idea. There are many men too efficient to be lightly thrown out of the service, yet too dull to be cured of their ill temper or their carelessness or their lack of ambition. In spite of their deficiencies experience has taught them a good deal. It is a tremendous task to keep a dozen superintendents, two dozen trainmasters and 2,000 to 20,000 other men so well acquainted with and adjusted to each other that there shall be no troublesome misunderstandings; and there must surely be a reasonable freedom from maladjustments if moral suasion, rather than force, is to be the chief means of discipline.

It comes down to the old and fundamental and inevitable

\*The principal features of the system are (1) a record of demerits to be kept against each employee, one demerit being estimated as equal to one day of suspension as practiced under former conditions, where suspension was the punishment for offenses too grave to be settled by reprimand and not sufficiently serious to warrant dismissal; (2) a rule by which a certain aggregate of demerits shall subject the employee to dismissal, or at least to the consideration of the question of dismissal, by the superintendent; (3) (on some roads) a clear record for 12 months, or some given number of months, serves to wipe out demerits previously accumulated; (4) bulletins, omitting names of persons, describing cases of negligence or misconduct for which employees have been charged with demerits, these bulletins to be posted at division headquarters for the instruction of all employees.

principle of discipline: "there must be a good understanding." Having good understanding with your men you are ashamed to suspend them. If you attempt an understanding with a man and find him too dull or crossgrained why should he not be dismissed? If a good understanding is impossible because there are too many subordinate officers between you and the "ultimate" employee the need is for stronger subordinates. Is there any better way out of the difficulty? In short, good discipline cannot be had merely by the operation of a machine; some strong man must put his personality into it; and he must do a lot of hard work. A strong man is needed because with all the friendliness of the Brown system there must be—as an ingredient in the friendliness—the sense and the courage to be severe with inefficient men when necessary; not a year after the necessity is apparent. A bad employee—one with no conscience; or an unfortunate one—one with the wrong type of brain—should not cumber the service for months while the superintendent is waiting for an automatic rule to slowly work out the man's doom. He should be got rid of promptly. Abolition of suspension is, after all, only a negative thing. The positive work comes after that. It has always been pretty plain that the success of Mr. Brown himself was due, not simply to the abolition of suspension, but to that and the employment of instruction, reproof and conference, the fruits of a friendly attitude on the part of the superintendent toward the employees. The fundamental question, as between Brown's discipline and the other kind is, which plan will best cure a man of his faults? Shall he take 10, 30 or more days off to reflect on the subject, or shall he be kept at work and do the reflecting while on duty—or before breakfast in the morning? Whichever plan is adopted, it is the company's duty to keep a record of the case, for the man's future efficiency is the main thing in which it is interested; and it is dangerous to trust entirely to memory in such matter.

We have referred to the need of having the discipline uniform throughout the service of a company, even if it have many districts and superintendents. This is desirable, of course, from any standpoint, but it is particularly so because the brotherhoods must be dealt with each as a unit for the whole road. Howsoever much we may disguise the fact, the dealings of a railway manager with any one of the brotherhoods constitute essentially a strenuous contest with one or a very few leaders representing—or having *prima facie* authority to speak for—men all over the road. With such an adversary it is essential that the railway officer be thoroughly equipped with every fact necessary to sustain his position; and it is only by establishing simplicity and uniformity that he can do this. With diverse practice and standards, or even too great diversity in the personal efficiency of his superintendents and trainmasters, to say nothing of standards, he is very badly handicapped.

Rewarding merit, either ordinary or exceptional, is the most elusive problem of the Brown system. The reward for ordinary merit is supposed to be conveyed through the pay car. For exceptional merit material rewards are usually inadequate or unsuitable. Commendation by notices in bulletins is either too rare to have much effect on the general morale of the force or else if indulged in freely it becomes common, and by its commonness loses its force. In short, the railway service, like the relations of master and servant in many other situations, is subject to some very troublesome limitations of human nature. Punishments have to be definite and severe, because good men make bad mistakes and good bosses often lack the courage, skill or energy to secure good conduct by gentle means. Rewards are not made definite or material because few men have learned how to give employees more than their cold earnings, without going to greater expense than is deemed practicable. The only "reward" over and above wages that has been found universally applicable is that which consists in a friendly (yet impartial) personal interest

on the part of the employer in the employee. In the railway service this can be only partially realized, at best, for the employer has to be represented by a deputy, or a sub-deputy, or a deputy still farther removed. But we scarcely need say that this is the true ideal, however numerous the rocks encountered in trying to attain it. We cannot restore the conditions of 30 years ago, when so many managers were personally acquainted with their employees, therefore the only alternative is to increase the efficiency of the deputy managers. The entertaining articles by trainmasters, which we are now publishing, give some practical suggestions on this point.

#### NEW PUBLICATIONS.

*The Iron Age Directory.* David Williams & Co., New York. 377 pages; 4½ x 6¾ in.; cloth. Price, 25 cents.

This is the thirteenth annual edition of this useful directory, which is an index of the products of regular advertisers in the *Iron Age*. The names of the articles are classified alphabetically, the names and addresses of the manufacturers being grouped under each product. The classification is carefully worked out and the cross indexing is so full that the desired article can be easily found.

*Lessons in Telegraphy.* By C. H. Sewall. D. Van Nostrand Co., New York. 88 pages; 4¾ in. x 7¼ in.; cloth. Price, \$1.

This is a very brief treatise, compared with most books on this subject, and it confines itself closely to the simple task of telling the beginner how to send and receive "Morse." The author is entirely familiar with his subject, and knows how to make his meaning clear. There is an error in proofreading here and there and there are mistakes in grammar in the examples set for operators to copy. The beginner is informed, very properly, that it will be difficult for any person to learn to send properly without an instructor. The learner is recommended to go to a school or a college, but the author is careful to say a school or college supplied with a good faculty.

*Directory of Directors in the City of New York, 1909-1910.* 860 pages; 5 x 8 in.; cloth. Price \$5. Published by The Audit Company of New York, 165 Broadway.

The tenth edition of the *Directory of Directors* has just come from the press. It contains this year the names of over 32,000 directors, each director given being followed, first by the name of the firm or company with which he is directly associated, and then by all the companies in which he is a director. Selected lists of corporations in banking, insurance, transportation, manufacturing and other lines of business, alphabetically arranged and accompanied in each case by the names of the company's officers and directors, are given in the back part of the volume, and also a list of all the New York exchanges, together with the officers. This book has become a very important reference directory, and is almost indispensable to a banker, lawyer or large merchant. It is printed this year on thin paper, which makes it somewhat more compact than heretofore.

*Engineer's Pocketbook of Reinforced Concrete.* By E. Lee Heldenreich. Chicago: The Myron C. Clark Publishing Co. 364 pages; 4¼ x 6½ in.; 164 illustrations; flexible cover.

While this book is offered as a pocketbook on reinforced concrete for use in the field, it is really a combination of pocketbook and text book with rather a preponderance toward the text book side. It is a compilation of data that the author has accumulated during several years of practice in concrete construction and so bears the stamp of practical value throughout. In the opening chapter, dealing with the materials, some very valuable tables are given regarding the voids, weights and other properties of sand and crushed stone as well as the quantities required for a yard of concrete when various combination of ratios are used. The same holds for the early pages of the second chapter on building design, where there are tables of strength of floor slabs and of columns that are very complete and comprehensive. From this point on the text book idea is brought out but there is always a goodly



amount of purely pocketbook contents that makes it all worth while. Besides the points already mentioned the book contains chapters treating on the construction of bridges, retaining walls, culverts, sewers, tanks and chimneys. In this numerous examples of constructions are given and the general method of calculating stresses set forth. The book closes with a glossary of the terms used in concrete construction and an index of the contents.

**Betterment Briefs.** A collection of papers on organized industrial efficiency. By Henry W. Jacobs, Assistant Superintendent Motive Power, Atchison, Topeka & Santa Fe Ry.; New York, 1909. John Wiley & Sons. Leather; 5½ x 9 in. Price, \$3.50.

The first edition of this work was published by the author in February, 1908, and the demand for it has been so large that a new and revised edition has been issued by John Wiley & Sons. It deals largely with methods of improving the efficiency of locomotive machine shops. The author has had a valuable experience in this particular work, especially during the past three years, when, as assistant superintendent of motive power of the Santa Fe, at Topeka, he has worked out numerous remarkable improvements in shop methods, machines and small tools. The improvements which were developed at Topeka have been extended to the shops of the whole Santa Fe system, and the description of these methods with numerous illustrations makes up an interesting and valuable treatise. The new chapters relate to "A General Tool System" and to "Locomotive Power Cost." Fully one-third of the volume deals with the general subject of "Organization and Efficiency in Railroad Machine Shops." The other of the more important chapters relate to the improvement in machine tools, gigs, templates and high-speed steel. A valuable feature is the full data as to time and cost of finishing various locomotive details by the old method and by the new and improved ones. Standardization of small hand tools for the system has been effected through the store department, and there is a chapter on "The Relation Between the Mechanical and Store Departments" which shows the new and original methods employed at the Topeka store department for economizing the various products of the main machine shop which are distributed to other shops on the system.

The book is well indexed and substantially bound and is thus properly prepared for the constant service it is destined to receive from numerous mechanical officers and shop foremen who will find it helpful in many ways in suggesting improved shop tools and methods of operation and organization.

**The Safety of British Railways.** By H. Raynar Wilson. 1909. London: P. S. King & Son, Orchard House, Westminster, S.W. 7½ x 5¼ in.; pp. 240. Cloth. Price, 3s. 6d. net.

The author of this book is very well acquainted with British railway practice and articles by him have occasionally appeared in these columns. He has here put together an interesting mass of facts concerning what has been done in Great Britain during the past 30 years to promote the safety of railway travel. On the general question of the safety of passengers in English railway cars the reader is perhaps already pretty well informed, but by a careful perusal of this book he can fortify his opinion with a forcible array of facts and he will at the same time give himself instructive entertainment. The statistics of railway accidents for many years past, together with those showing the progress made in the United Kingdom in the adoption of block signals and interlocking, gathered from innumerable government documents, are here condensed in convenient form. The great progress which has been made in England in the promotion of safety on railways has been largely the result of the lessons derived from collisions and derailments, as lucidly set forth in the reports of the inspecting officers of the board of trade for many years; and these reports Mr. Wilson makes good use of, abstracting and copying in a way to give the reader the gist of the great mass of matter which has been published.

In recounting the earlier history of the British government's activity Mr. Wilson makes a judicious abstract. He

omits, however, to note one interesting incident, that of the temporary transference of the railway duties of the board of trade in 1846 to a special body of railway commissioners. This lasted for five years. Not all readers will agree with the author's philosophizing concerning the relative shares of "the man" and "the machine" in those failures which lead to disaster on railways, but on the whole the reader will find this little book unusually interesting. The British government first and last has done a good deal of railway regulating, but it must be admitted that the officers of the Board of Trade and those leaders in Parliament who have had a hand in this work have carried out a fairly consistent purpose to steer a middle course between undue interference with freedom of action and responsibility of the carriers on the one hand and on the other a regard for the demands of the public which has made necessary the exercise of some degree of pressure. In England as in America the dilatory railway officer seems always in evidence, provoking governmental interference. Mr. Wilson does not neglect his opportunity to show up the glaring differences between the railway accident records of America and those of Great Britain.

## Letters to the Editor.

### THE EASY GRADES OF THE C. C. & O.

Johnson City, Tenn., August 2, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

I notice in the description of the heavy caboose cars recently built for this road (the Carolina, Clinchfield & Ohio), which appeared in your issue of July 9, that you say that there are severe grades at several places on the line. I shall be much obliged if you will correct this statement, as the steepest grade against the loaded movement on the road that we have built is one-half of 1 per cent.; and on curves the grade is compensated. This should hardly be classed as "severe." In the description of the road which was published in your issue of March 19 the facts concerning the line are correctly stated.

W. F. STEFFENS,

Engineer of Bridges and Buildings.

### WILLIAM STEWART AND WILLIAM HARRISON STEWART.

Pennsylvania Lines West of Pittsburgh, }  
Pittsburgh, Pa., August 16, 1909. }

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

The publication of the death of William Harrison Stewart in your paper of August 6 has led to a good deal of misapprehension among the friends of William Stewart, who is still very much alive. William Harrison Stewart was division freight agent at Cleveland. William Stewart, who was general freight agent of the Cleveland & Pittsburgh, later became freight traffic manager of all of the Pennsylvania Lines West of Pittsburgh. He retired from the railway service in 1897, much to the regret of his many friends. He is at present traveling in Europe, but expects to return to Pittsburgh soon.

S.

### THE CONDUCTOR'S PERPLEXING DUTIES.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

In the recent articles regarding the employment of train auditors no notice has been taken of their necessity except to prevent loss of revenue from the failure of conductors to remit cash collections; but it is probable that many accidents, caused from overlooking orders or the schedules of superior trains never would have occurred if there had been a man on the train with nothing to do except see that his train had a

right to the main track or that it was not on it or, if on it, was protected.

An experienced man can carry many things on his mind without overlooking anything, and a busy man is less liable to overlook something than an idle man, if the idle man is in the presence of another. But there are many chances for oversight on the part of passenger conductors on busy single track roads, and the accident bulletins show that the oversights and accidents do occur. Let us take an example. The conductor receives the following orders at the terminal telegraph office: One order to meet other passenger trains; one or more orders to run late over different parts of the division (as late trains are allowed to make up time the order to run late cannot run the train as late as it actually leaves the terminal and it has to be supplemented by orders to wait at different stations for important freight trains); and finally orders regarding track damaged by heavy rains or other causes, speed reductions on account of gangs renewing and repairing bridges or tracks. In addition to this the conductor reads the messages sent to him about various matters, checks bulletin boards and gets memoranda of the various bulletins, including the numbers of tickets and passes that are in improper hands and to be lifted. After checking the register and registering, and going over the orders with the engineman, he is ready to leave the terminal and begin working his train. The cars may be crowded with passengers, who ask him all kinds of questions, and he is probably badly hurried to get through his trains between stopping places. I have seen cases like this, day after day, on several different roads, both east and west. Even if it were only an occasional occurrence steps should be taken to prevent possibility of oversight and accident.

There is one instance where a committee from the Order of Railway Conductors had a request honored by the management of one of our large railways, as regards a piece of road 29 miles long, not to issue orders to one particular train, except against superior trains and to run late, and to cover bad track, if any; the claim being that the conductor could not look out for orders, as usually received, and also properly work his train. The request was complied with, but freight traffic was delayed by it.

The responsibility for the rights of the train cannot be placed on the engineman, as suggested in the article by "General Auditor," because the engineman has enough to do to handle his engine and keep a proper lookout ahead, especially when some journal is running hot, or the engine is foaming, or giving trouble otherwise. With the number of signals and other things to be looked out for, the engineman should not be required to consult a time-table, or do anything else that prevents his view of the signals and track ahead while running at a high rate of speed.

Why not turn the passengers over to the train auditor? On freight trains switching and other work could be turned over to a senior brakeman (this would not necessarily increase the number of employees on freight trains), leaving the conductor free from all duty except that of seeing that his train was clear of the main track unless it had a right upon it. As what is everybody's business is nobody's business hold this one man solely responsible for fulfilling the orders and keeping clear of superior trains. The engineman would want copies of the orders, and the meeting points might be made known to the entire crew, but let the conductor, or whatever his title may be, fully realize that everybody will censure him, and him alone, for anything wrong that happens.

A man with this responsibility should be especially trained for the work, and while on duty should not be allowed to remain in company with others.

A good plan would be to lengthen our engine tenders sufficiently to accommodate a cupola, elevated so that the person in charge would have a clear view of the engine crew and everything ahead, and be in clear view of the engine crew,

and, on freight trains, of the middle brakemen. This would put a check on the conductor and engineman, prevent sleeping on duty, and fill the long felt want of a third man on the engine to act in case of the engineman's sudden death, or injury from any cause. Trains should have men enough in the crew to pass signals from one end to the other at all times and places. The person in charge of the train could receive signals through the middle brakeman when the flagman starts out, and could take action should he fail to go promptly.

OBSERVER.

[The foregoing is from a train despatcher. Our remedy for forgetfulness on the part of conductors is the adoption of the block system. A perusal of this letter will help to explain—though it is to be hoped that no railway officer needs any explanation—how difficult it is to meet this question in any other way than by the introduction of the space interval.—Ed.]

## Contributed Papers.

### AN IDEAL INDEX FOR RAILWAY CORRESPONDENCE FILES.

BY JOSEPH GUIDINGER.

An index system to be complete in every respect should meet the following requirements: (a) be elastic: that is, permit of items being readily added to it in alphabetical order, or of changes and rearrangements being made in the same; (b) be easily understood and used by any person, whether or not he is familiar with the index or has ever had occasion to use it: i. e., anyone in the office should be able to refer to it without difficulty; and (c) identify its files so fully and completely that any letter therein may be instantly found, whether it be a letter of recent date or one that is many years old.

Such an index was originated by me and placed in service

Accounting circulars 886  
Department, subscription paper circulated in- 471

Accounts with Las Vegas and other Banks along Line 982  
of the Road to be audited by special auditors 1083  
charges to Construction and Operating- 537

Fig. 1.

several years ago in the office of the Second Vice-President of the San Pedro, Los Angeles & Salt Lake, and later was also adopted by several departments of the Las Vegas & Tonopah Railroad Company. The results obtained from its practical operation during these many years have proven the system as measuring up to every requirement mentioned above. While in this article we refer to it as applied to correspondence files, this index may be readily adapted to any system of filing in any railway department, whether of correspondence, documents, maps, catalogues, etc., etc.; and no changes need be made in the files themselves other than to give them suitable numbers.

Standard index cards are used, 5 x 8 inches in size, with tabs 12-cut. To elucidate the system we illustrate eight cards taken at random from an index in actual use. The tab of each



card bears the index of the first or key-words of the files identified on the card. For example: referring to Fig. 1 we find the tab bears index "Acco" to identify files whose key-words are "Accounting" and "Accounts"; tab of Fig. 2

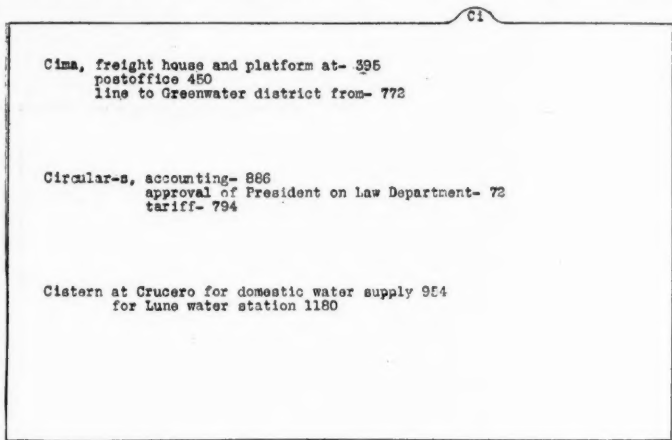


Fig. 2.

bears index "Ci" to identify files with key-words "Cima," "Circular-s," "Cistern," and any other files whose first words commence with Ci that may be added from time to time. These cards are kept in alphabetical order in card cabinet, as shown below for cards under letter S. (Fig. 3.)

When a card has been written full, for purposes of quick

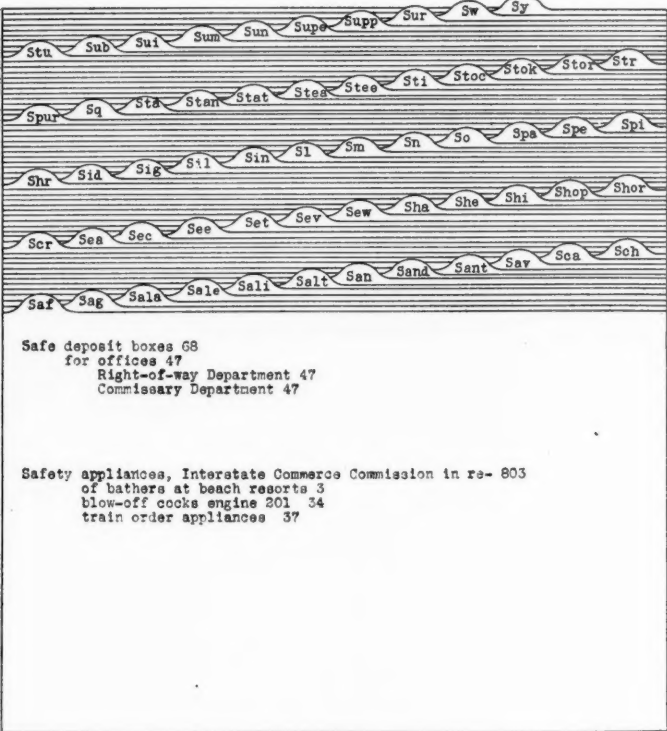


Fig. 3.

reference it is rewritten in alphabetical order. For example: original card "Las" (Fig. 4) was rewritten to appear as in Fig. 5 and the following cards are the same tab-cut, but marked "Las" "Las" 3a 3b to facilitate keeping them in their proper place in the cabinet. The subdivision "3" is for key-word "Las Vegas (town)"; and the other cards "Las" (not shown) are "Las" 1 for "Las Vegas Land & Water Company" "Las" 2 for "Las Vegas Ranch," "Las" 4 for "Las Vegas & Tonopah Railroad,"

and "Las" 5 for sundry files whose first words commence with Las. Thus it will be noted that, while the index "Las" covers a multiplicity of files, by this method of segregation they are easily referred to. Nor is it at all difficult to make this segregation, as it assumes shape during the natural growth of the index. For example: the card shown in Fig. 6 is still in its original form, and when rewritten full it will be transferred to three cards bearing tab indices "Lunc," "Lund" 1 and "Lund" 2

To prevent two cards bearing duplicate lists of files we make reference from one card to its duplicate, and show the list only on the latter. For example: referring to last item on

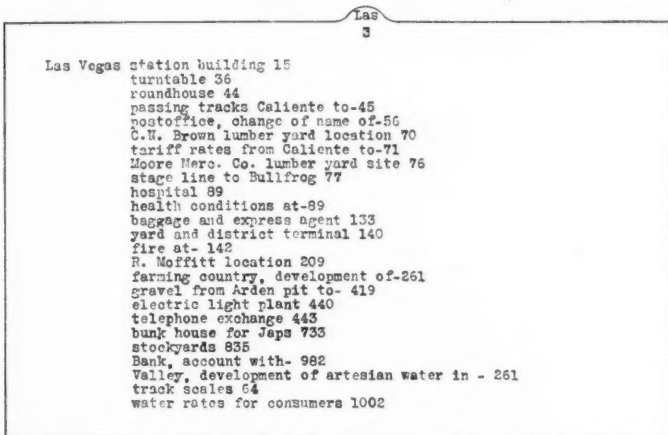


Fig. 4.

the card shown in Fig. 7, "Law suits (See suits)," instead of repeating the list of files identified on card marked "Suit" (not shown) we merely make reference to the card itself. "Depot" and "Station" is a like case of duplication of a long list of files, to prevent which reference is made from one card to the other and the files shown but once in detail on the card referred to.

The card "Mor" (Fig. 8) is an illustration of the cases where

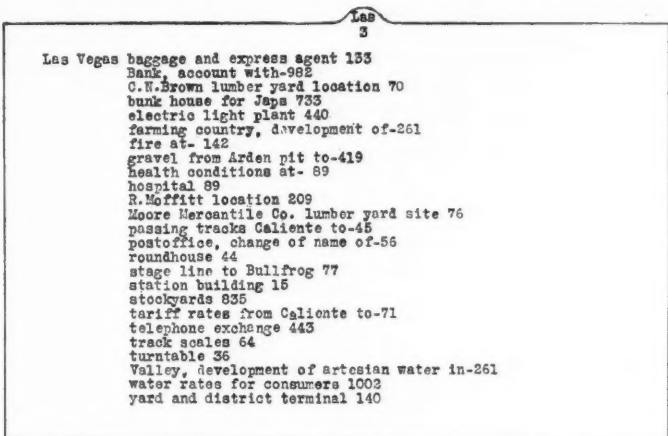


Fig. 5.

a tab index covers sundry key-words, its index covering "Mor" to "Mot" inclusive. However, when this card is rewritten it will be transferred to two or possibly three cards, namely: "Mor," "Mos" and "Mot."

In the foregoing paragraphs I have explained the elasticity and ready reference features of this index system, mentioned in the beginning of this article. However, item (c): definite and complete identification of the files, so that they may be instantly found by anyone, is the important requirement and therefore should be given very careful attention by the file clerk. The clerk should always bear in mind that the index is not alone for his benefit, or merely for temporary use; but

that it should be kept in such shape as to be readily used by anyone at any time during an indefinite number of years.

To accomplish such identification of a file we index every possible key-word that can be applied to it; in other words, we arrange and index the title of the file in as many different ways as it may be stated. For example: referring to the card shown in Fig. 9 we find under key-word "Construction" the file "Construction and operating accounts, charges to 537"; and by

Filing tariffs with California Railroad Commission, 1002.  
Merchants Ice & Cold Storage Co. ice house at Long Beach, 1204.

Storage track at Topliff, 237.

Moving Draper water tank, 563.

M. C. Chase fuel oil tank at Jean, 1205.

I. C. C. instructions in re charges to construction and operating accounts, 537.

Lun

Lunch and news counter privileges 143  
room at Lynn 751  
Kelso 435  
counter facilities at Caliente 519

Lund, coal house at- 148  
section houses at- 131  
freight room at- 728  
stockyards at- 943  
cistern for water station 1180

C.G. Lundholm, joint Master Mechanic with L.V. & T. R.R. 190  
J.B. Lund coal house site at Modena 806

Fig. 6.

Mor

Morden Frog & Crossing Works, frogs and switches 32  
Morning train reports 135  
Morris, claims to be investigated by Special Agent- 94  
Moroni, spur for Utah Sugar Co. at- 146  
Morrison Bros. transfer privileges at Pasadena 500  
Morris, Garfield Water Co. cement warehouse at- 637  
Mortgage foreclosure Eriksen Beach Hotel 873  
Moscow Mining & Milling Co. facilities at Laho 1093  
Motor car service 1095  
Motive Power Department, mechanical draftsman for- 90

Fig. 8.

referring to the first card illustrated above, index "Acco," we find the same file identified under key-word "Accounts"; and it is also found on cards (not shown) bearing indices "Char" and "Oper," the legends reading: "Charges to construction and operating accounts, 537" and "Operating accounts, charges to construction and—537." Thus this one file is identified four times on as many different cards, and therefore may be found under whatever title it is sought. On the other hand, had the file been indexed only once, say under title of "Charges to construction and operating accounts," it would be necessary for the party seeking the file to be more or less familiar with

Referring to last item on memorandum:

"I. C. C. instructions in re charges to construction and operating accounts, 537," being an addition to file 537 explained above in detail; correspondence came up with the Interstate Commerce Commission on this subject, the new title was immediately entered on the desk memorandum and will be further indexed on cards marked "Inter" and "Inst," the additional identifications reading:

"Interstate Commerce Commission instructions in re charges to construction and operating accounts, 537" and "Instructions from Interstate Commerce Commission in re charges to con-

Law

Law Dept., annual reports from- 98  
circulars, approval of President on- 72  
expenses for stationery 89  
offices expenses, Salt Lake City 102  
salaries of- 7  
Library for- 268

books, shipment of for F.M. Clarke 94  
governing cattle shipments 786  
suits (See suits)

Fig. 7.

Conb

Construction and Operating accounts, charges to- 537  
estimated requirements for- 880  
instructions to avoid delaying- 233  
work, engines on- 34  
rates for Tonopah & Tidewater RR 653

Department employees, schedule of pay of- 58  
estimate of expenses of- 82  
method of keeping time 8  
retaining cars at Daggett needed here 52  
transfer of Parriott to- 78  
inventory of tools and material 475

Fig. 9.

It and probably depend somewhat on his memory in order to readily find it, or even find it at all.

And further, if at any time after a file has begun there is added to it other correspondence with title of a more or less different form, the new title is at once entered on desk memorandum and indexed to cover the changes:

#### DESK MEMORANDUM.

Line to Ely District, 1200.

Sand and gravel for C. Ganahl Lumber Co., Las Vegas, 584.  
Industrial track at Avenue 16, Los Angeles, 1201.

Black Rock station building, 1202.

Extension of spur at Jean for Monte Cristo Mining Co., 1203.

Relaying rail Sixth District, 516.

Motor car service, 1095.

struction and operating accounts, 537"; a total of six identifications for one file.

As new files are made, or old ones added to, their names and numbers are written on the memorandum and at first opportunity, or as time is found to do so, transfer is made to the index cards. However, more than ten or a dozen file names should not be allowed to accumulate before transferring same to the cards. The sample memorandum shows six new files: Nos. 1200 to 1205, inclusive, numbered consecutively as made; and it also shows several old files covering changes in their titles, as explained in preceding paragraph. File 1095, "Motor car service," is the last item checked off as having been transferred to the cards, card "Mor" above bearing one of its identifications.





LIST OF PRINCIPAL PASSENGER STATIONS, SHOWING THE ROADS USING EACH.

CENTRAL STATION (12TH ST. STATION). GRAND CENTRAL PASSENGER STATION.

C. C. & L.  
C. C. C. & St. L.  
I. C.  
M. C.  
W. C.

B. & O.  
C. G. W.  
C. T. T.  
P. M.

DEARBORN STATION.

A. T. & S. F.  
C. I. & L.  
C. & W. I.  
Erie.  
G. T.  
Wabash.

LA SALLE STREET STATION.

C. I. & S.  
C. R. I. & P.  
C. & E. I.  
L. S. & M. S.  
N. Y. C. & St. L.

UNION DEPOT.

C. B. & O.  
C. M. & St. P.  
C. & A.  
P. C. C. & St. L.  
P. Ft. W. & C.

WELLS STREET STATION.

C. & N. W.

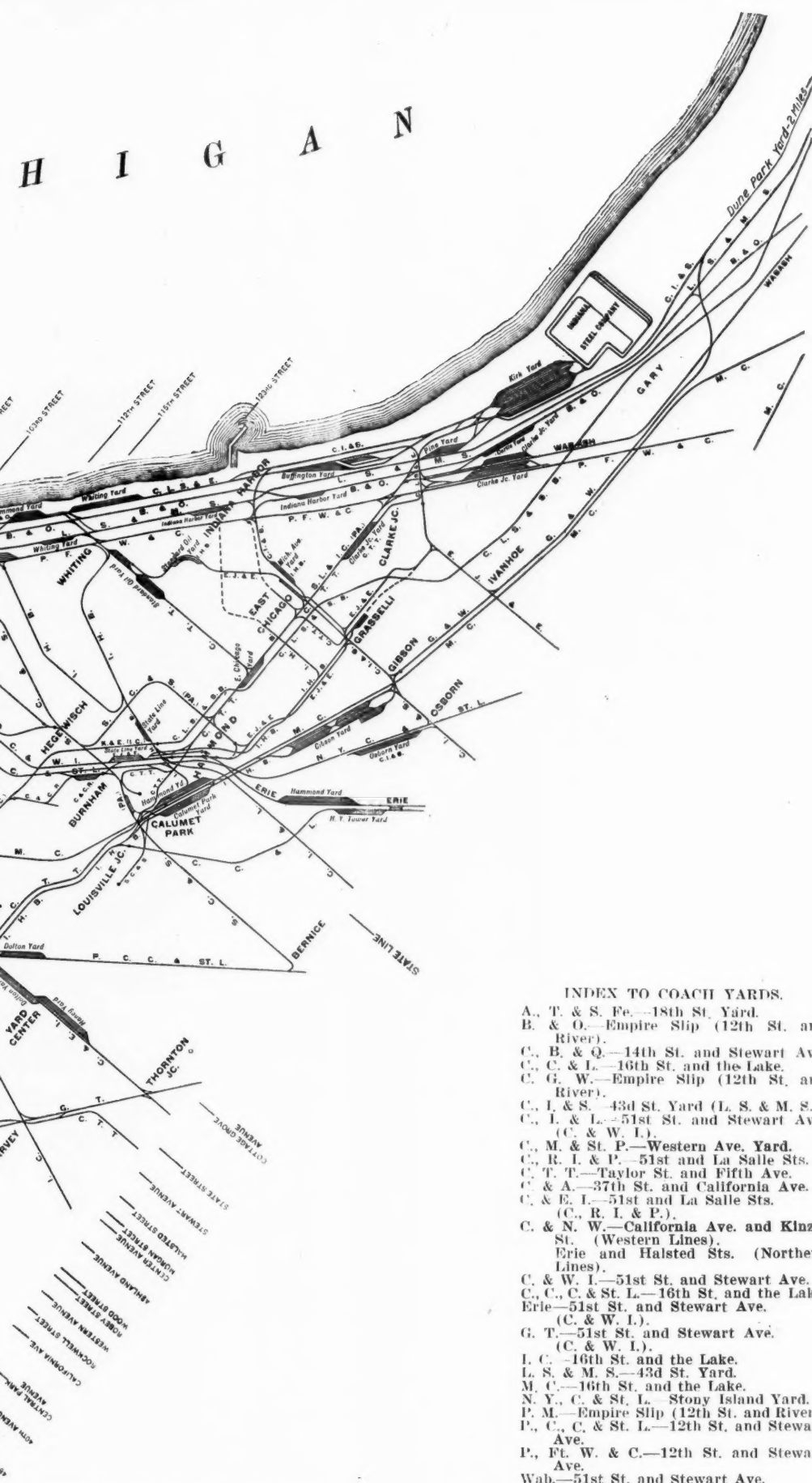
RAILWAY MAP OF CHICAGO AND VICINITY; MAIN LINES, CONNECTING TRACKS AND Y

From a copyright map made by Rand, McNal



OF CHICAGO AND VICINITY; MAIN LINES, CONNECTING TRACKS AND YARDS, INCLUDING TRACKS IN C  
 From a copyright map made by Rand, McNally & Co.

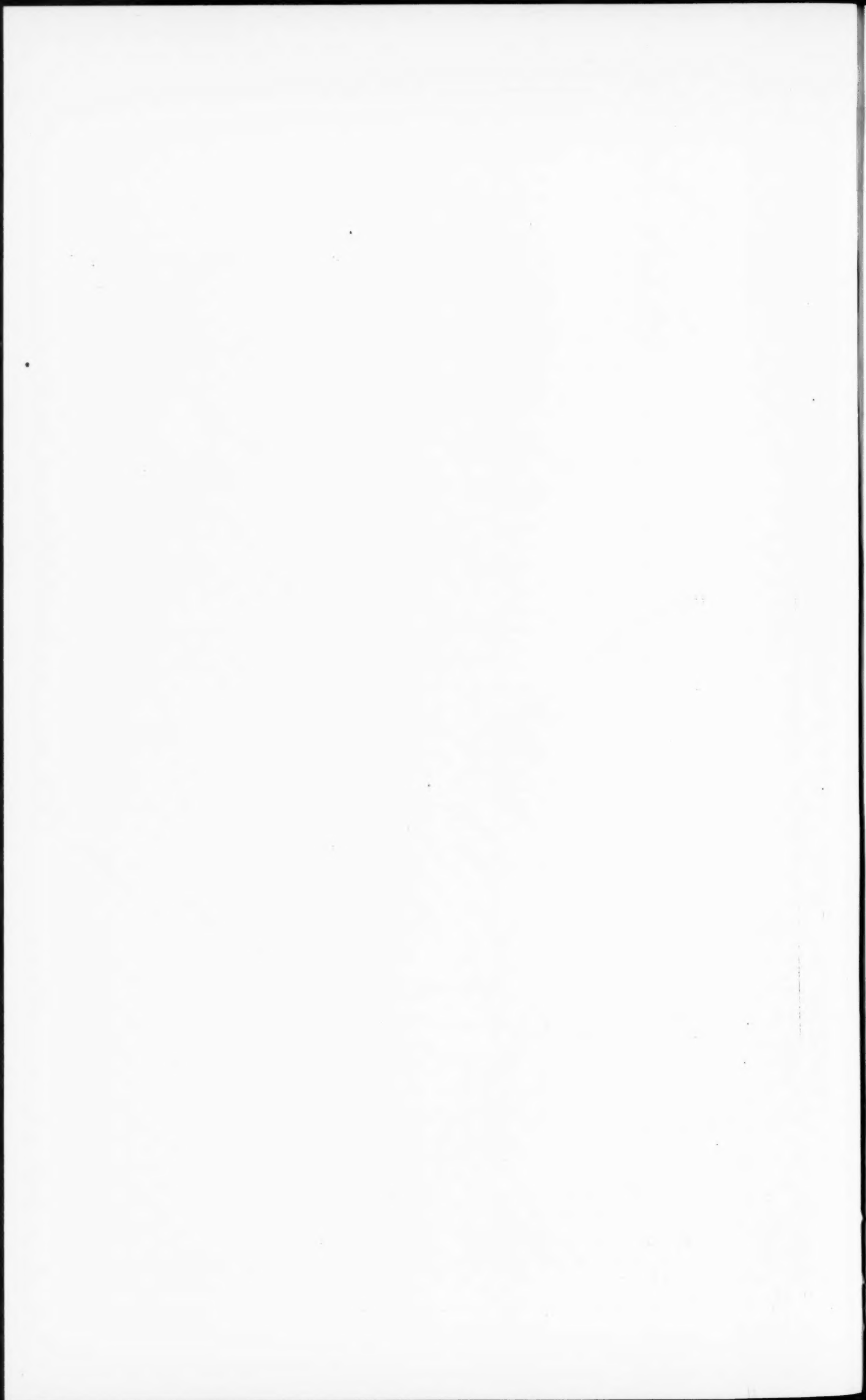




#### INDEX TO COACH YARDS.

- A., T. & S. Fe.—18th St. Yard.
- B. & O.—Empire Slip (12th St. and River).
- C., B. & Q.—14th St. and Stewart Ave.
- C., C. & L.—16th St. and the Lake.
- C. G. W.—Empire Slip (12th St. and River).
- C., I. & S.—43d St. Yard (L. S. & M. S.).
- C., I. & L.—51st St. and Stewart Ave. (C. & W. I.).
- C., M. & St. P.—Western Ave. Yard.
- C., R. I. & P.—51st and La Salle Sts.
- C. T. T.—Taylor St. and Fifth Ave.
- C. & A.—37th St. and California Ave.
- C. & E. I.—51st and La Salle Sts. (C., R. I. & P.).
- C. & N. W.—California Ave. and Kinzie St. (Western Lines).  
Erie and Halsted Sts. (Northern Lines).
- C. & W. I.—51st St. and Stewart Ave.
- C., C. & St. L.—16th St. and the Lake.
- Erie—51st St. and Stewart Ave. (C. & W. I.).
- G. T.—51st St. and Stewart Ave. (C. & W. I.).
- I. C.—16th St. and the Lake.
- L. S. & M. S.—43d St. Yard.
- M. C.—16th St. and the Lake.
- N. Y., C. & St. L.—Stony Island Yard.
- P. M.—Empire Slip (12th St. and River).
- P., C. & St. L.—12th St. and Stewart Ave.
- P., Ft. W. & C.—12th St. and Stewart Ave.
- Wab.—51st St. and Stewart Ave. (C. & W. I.).
- W. C.—16th St. and the Lake.

IN COURSE OF CONSTRUCTION.





## MAP OF CHICAGO TERMINAL DISTRICT.

[WITH AN INSET.]

The map of the Chicago terminal district shown on the inset accompanying this issue is reduced from a large one which has been prepared under the direction of officers of the Chicago Union Transfer Company and has been published by Rand, McNally & Co., who have the copyright. It is the first map ever published which shows all of the numerous yards in the Chicago switching district and the connections of the seemingly innumerable roads. It illustrates in a striking manner both the magnitude of the Chicago switching district and the complexity of the network of tracks by which it is covered.

Information concerning the large passenger stations and the passenger car storage yards is given in the margins of the sheet which bears the map, and other information is given below.

## INDEX TO RAILWAYS.

- A. T. & S. F.**—Atchison, Topeka & Santa Fe. Uses C. & W. I. 18th street to Dearborn Station.
- B. & O.**—Baltimore & Ohio. Uses C., R. I. & P., 93d street (Rock Island Junction) to Brainerd Junction; B. & O. C. to Forest Hill; C. T. T. to Grand Central Passenger Station.
- B. & O. C.**—Baltimore & Ohio Connecting R. R. (B. & O.).
- Belt**—Belt Railway of Chicago. Uses all of C. & W. I. tracks.
- C. H. & S. E.**—Calumet, Hammond & South Eastern.
- C. R.**—Calumet River Ry. (Pennsylvania).
- C. W.**—Calumet Western Ry. (M. C.; Penna.; I. H. B.; C., R. I. & P.).
- C. & S. E.**—Calumet & South Eastern.
- C. B. & Q.**—Chicago, Burlington & Quincy. Uses P., Ft. W. & C., 16th street to Union Depot.
- C. & L.**—Chicago, Cincinnati & Louisville. Uses I. H. B., Louisville Junction to Dolton; I. C., Riverdale to 12th Street Station and Jackson Street Yard.
- C. G. W.**—Chicago Great Western. Uses C. T. T., Forest Home to Grand Central Passenger Station.
- C. I. & S.**—Chicago, Indiana & Southern. Uses L. S. & M. S., Indiana Harbor to La Salle Street Station.
- C. I. & L.**—Chicago, Indianapolis & Louisville Ry. Uses C. & W. I., State Line to Dearborn Station.
- C. J.**—Chicago Junction Ry. Uses C., R. I. & P.
- C. L. S. & E.**—Chicago, Lake Shore & Eastern. Uses E. J. & E. tracks. Also C., T. T., I. H. B., Whiting to Franklin Park. Also B. & O., Whiting to 93d street (Rock Island Junction); C., R. I. & P., to Brainerd Junction; B. & O. C. to Forest Hill; C. T. T. to 48th street; C. R. I. and C. J. to Bridgeport.
- C. L. S. & S. B.**—Chicago, Lake Shore & South Bend. Uses K. & E., State Line to Kensington.
- C. M. & St. P.**—Chicago, Milwaukee & St. Paul.
- C. R. & I.**—Chicago River & Indiana. Uses C. J. tracks.
- C. R. I. & P.**—Chicago, Rock Island & Pacific.
- C. S. L.**—Chicago Short Line Ry. Uses B. & O., Whiting to 93d street (Rock Island Junction); C., R. I. & P. to Brainerd Junction; B. & O. C. to Forest Hill.
- C. S.**—Chicago Southern Ry. Passenger service not established. Freight business handled by C. T. T. from Chicago Heights.
- C. T. T.**—Chicago Terminal Transfer. Uses B. & O., Whiting to South Chicago.
- C. U. T.**—Chicago Union Transfer Ry.
- C. W. P. & S.**—Chicago, West Pullman & Southern.
- C. & A.**—Chicago & Alton. Uses P., Ft. W. & C., 21st street to Union Depot.
- C. & C. R.**—Chicago & Calumet River.
- C. & E. I.**—Chicago & Eastern Illinois. Uses C. & W. I., Dolton to 79th street; C., R. I. & P. to La Salle Street Station. Also C. & W. I., Dolton to Dearborn Station.
- C. & I. W.**—Chicago & Illinois Western. Uses I. C., Hawthorne to Ash street; C. J. to U. S. Yards.
- C. & N. W.**—Chicago & North Western.
- C. & W. I.**—Chicago & Western Indiana.
- C. C. C. & St. L.**—Cleveland, Cincinnati, Chicago & St. Louis. No tracks or yards in Chicago. I. C. handles traffic between Chicago and Kankakee.
- E. J. & E.**—Elgin, Joliet & Eastern. Uses C., L. S. & E. tracks. Also C. & W. I. and Belt, State line to South Chicago.
- E. C.**—Englewood Connecting Ry. (Pennsylvania).
- Erie**—Erie R. R. Uses C. & W. I., State Line to Dearborn Station.
- G. T.**—Grand Trunk. Uses C. & W. I., 49th street to Dearborn Station.
- G. & W.**—Gary & Western (N. Y. C. Lines).
- I. C.**—Illinois Central.
- I. N.**—Illinois Northern.
- I. H. B.**—Indiana Harbor Belt R. R. Uses C., I. & S., Gibson to Indiana Harbor and Dune Park; C., L. S. & E., Indiana Harbor to South Chicago; S. C. & S., Calumet Park to Hegewisch; C. R., South Chicago to Hegewisch; C. W., 106th street to Hegewisch; M. C., Calumet Park to Gibson.
- K. & E.**—Kensington & Eastern (Illinois Central).
- L. M. C. F. T.**—Lake Michigan Car Ferry Transportation Co. (Wisconsin & Michigan).
- L. S. & M. S.**—Lake Shore & Michigan Southern.
- M. J.**—Manufacturers' Junction Ry.
- M. C.**—Michigan Central. Uses I. C., Kensington to 12th Street Station and Jackson Street Yard.
- N. Y. C. & St. L.**—New York, Chicago & St. Louis. Uses L. S. & M. S., Grand Crossing to La Salle Street Station.
- P. M.**—Pere Marquette. Uses L. S. & M. S., Porter, Ind., to Clarke Junction; P., Ft. W. & C. to 16th street; C. T. T. to Grand Central Passenger Station. Also C. T. T., Clarke Junction to Grand Central Passenger Station.
- P. C. C. & St. L.**—Pittsburg, Cincinnati, Chicago & St. Louis.
- P. F. W. & C.**—Pittsburgh, Ft. Wayne & Chicago.
- Pullman**—Pullman R. R.
- S. C. A. L.**—St. Charles Air Line (I. C.; M. C.; C. & N. W.; C., B. & Q.).

**S. C. & S.**—South Chicago & Southern (Pennsylvania).

**S. L. & I. C.**—State Line and Indiana City (Pennsylvania).

**Wab.**—Wabash R. R. Uses C. T. T., Clarke Junction to State Line; C. & W. I. to Dearborn Station. Also C. & W. I., 75th street to Dearborn Station.

**W. C.**—Wisconsin Central. Uses C. T. T., Altenheim to Forest Home; I. C. to 12th Street Station and Jackson Street Yard.

**W. & M.**—Wisconsin & Michigan Ry. Uses L. M. C. F. T., Peshtigo Harbor, Wis., to South Chicago.

## INDEX TO FREIGHT STATIONS.

ABBREVIATIONS.—(Union—) indicates Union Station operated by road named. (T) indicates Tunnel connection. (L) indicates dock at station, and (L—) dock nearest station at which outbound city freight is received from the lighterage companies' docks.

- A. T. & S. F.**  
Twelfth street (T), Twelfth and State streets. (L. Taylor street dock C. T. T.)  
Fourteenth street (T), Fourteenth and State streets.  
Bridgeport, Twenty-sixth and Lime streets.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Western avenue, (Union, C. T. T.).  
Corwith, Thirty-eighth street and Central Park avenue.
- B. & O.**  
No. 1 (T), Polk street and Fifth avenue.  
No. 2 (T), Polk and Franklin streets.  
No. 3, Polk street and Fifth avenue.  
No. 4, Fifteenth and Morgan streets.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
No. 7, (Union, C. B. & Q.).  
No. 8, (Union, C. B. & Q.).  
Western avenue, (Union, C. T. T.).  
South Chicago Transfer, 87th street and Ontario avenue.  
South Chicago, 90th street and Ontario avenue.  
Indiana Harbor, Regent street and Michigan avenue.  
Gary, Virginia street and tracks.
- C. B. & Q.**  
No. 1, Canal and Harrison streets.  
No. 2 (T) Canal and Harrison streets. (L. 16th street dock.)  
No. 3 (T), Canal and Harrison streets.  
No. 4, Sixteenth street and Stewart avenue.  
No. 5, Sixteenth and Canal streets.  
No. 6, Sixteenth and Jefferson streets.  
No. 7, Nineteenth street and Western avenue. (Union, C. B. & Q.)  
No. 8, Blue Island avenue and Paulina street. (Union, C. B. & Q.)  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Hawthorne, 26th street and 52d avenue.  
Clyde, 29th street and Garfield avenue.  
La Verne, 31st street and Ridgeland avenue.  
Berwyn, 32d street and Oak Park avenue.  
Riverside.  
Congress Park, Dubois avenue and tracks.
- C. C. & L.**  
South Water street (T), foot of South Water street.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
No. 7, (Union, C. B. & Q.).  
No. 8, (Union, C. B. & Q.).  
Western avenue, (Union, C. T. T.).  
Hammond.
- C. G. W.**  
Harrison street (T) (L), Harrison and Franklin streets.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Western avenue, (Union, C. T. T.).  
Chicago Transfer, 52d avenue and tracks.  
Forest Home, DesPlaines avenue and tracks.  
Maywood, Thirteenth street and Fifth avenue.
- C. I. & S.** (See L. S. & M. S. for joint stations.)  
Hammond.  
East Chicago, 152d street and tracks.  
Grasselli, 152d street and tracks.  
Indiana Harbor, 132d street and tracks.
- C. I. & L.**  
Taylor street (T), Taylor street and Custom House Place.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Englewood, 65th and Wallace streets.  
Hammond.
- C. J.**  
Union Stock Yards, 43d and Robey streets, (Union, C. J.).
- C. M. & St. P.**  
Nos. 1 and 8 (T), between Union and Green streets.  
Nos. 2 and 3 (T), between Union and Jefferson streets.  
Nos. 5 and 7, Kinzie and Kingsbury streets.  
No. 6, Fifteenth and Jefferson streets.  
No. 4 (L), Lake street and river.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Western avenue, (Union, C. T. T.).  
Galewood, 56th and Armitage avenues.  
Division street, No. 56 East Division street.  
Deering, Fullerton avenue and river.  
Elsmere, Kimball avenue and Bloomingdale road.  
Hermosa, Tripp avenue and tracks.  
Cragin, 51st avenue and tracks.
- C. R. I. & P.**  
Taylor street (T), Taylor and Sherman streets. (L. 13th street dock.)  
Taylor street (T), Taylor and Sherman streets.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Western avenue, (Union, C. T. T.).  
Englewood, 63d street and tracks.  
Auburn Park, 78th street and tracks.  
Brainerd, 89th and Loomis streets.  
Morgan Park, 111th street and Prospect avenue.  
Burr Oak, 123d and Division streets.  
Blue Island, Grove and Vermont streets.  
Washington Heights, 104th and Meriden streets.  
South Chicago, 94th street and Commercial avenue.
- C. T. T.**  
Western avenue, Western and Ogden avenues, (Union, C. T. T.).  
Taylor street (L), Taylor street and river, (Union, C. T. T.).

- C. U. T.  
Clearing, 68th street and Central avenue.
- C. W. P. & S.  
West Pullman, 119th and Morgan streets.
- C. & A.  
Harrison street (T), Harrison street and river, inbound.  
Harrison street (T), Harrison street and river, outbound.  
Dock House (L), Harrison street and river.  
Bridgeport, 24th and Halsted streets.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Western avenue, (Union, C. T. T.).  
Brighton Park, 37th street and California avenue.
- C. & E. I.  
Twelfth street (T), Twelfth and Clark streets.  
Taylor street (T), Taylor and Clark streets.  
Transfer House, Taylor and Clark streets, (L, 16th street dock).  
Union Stock Yards, (Union, C. J.).  
Western avenue, (Union, C. T. T.).  
McCormick, (Union, I. N.).  
Englewood, 65th and Wallace streets.  
Auburn Park, 81st street and tracks.  
Fernwood, 103d street and tracks.  
Roseland, 111th street and tracks.  
Kensington, Michigan avenue and tracks.  
Dolton, Lincoln avenue and tracks.
- C. & N. W.  
Wood street, Fourteenth street and South Oakley avenue.  
Fortieth avenue, 46th and Chicago avenues.  
Western avenue, Fifteenth street and Western avenue.  
Sixteenth street, Sixteenth and Meagher streets.  
Grand avenue (T), Canal and Kinzie streets.  
Grand avenue (T), Canal street and Grand avenue.  
State street (T), State street and river, inbound.  
State street (T), State street and river, outbound.  
North avenue, Holt street and North avenue.  
Deering, Fullerton avenue and tracks.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Avondale, Kedzie and Belmont avenues.  
Irving Park, Addison street and Central Park avenue.  
Mayfair, 47th and Montrose avenues.  
Austin, Central avenue and tracks.  
Ridgeland, Ridgeland avenue and tracks.  
Oak Park, Harlem avenue and tracks.  
River Forest, Gage avenue and tracks.  
Maywood, Fifth avenue and tracks.  
Melrose Park, Nineteenth avenue and tracks.
- Erie.  
Fourteenth street (T), Fourteenth and Clark streets.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
No. 7, (Union, C. B. & Q.).  
Englewood, 65th and Wallace streets.  
Auburn Park, 78th street and tracks.  
Burnham, 134th street and tracks.  
Hammond.
- G. T.  
Taylor street, Taylor street and Plymouth place.  
Twelfth street, Twelfth street and Plymouth Place.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
No. 7, (Union, C. B. & Q.).  
No. 8, (Union, C. B. & Q.).  
Eldon, 51st street and tracks.  
Chicago Lawn, 63d street and tracks.  
Blue Island, Broadway and tracks.  
Harvey, 152d street and tracks.
- I. C.  
In freight (T), foot South Water street.  
Out freight (T) (L), foot South Water street.  
East and west fruit, foot South Water street.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Western avenue, (Union, C. T. T.).  
Grand Crossing, 75th street and tracks.  
Fordham, 90th street and Greenwood avenue.  
Kensington, 115th street and tracks.  
Riverdale, 137th street and tracks.  
Harvey, 155th street and tracks.  
South Chicago, 93d street and Erie avenue.  
West Pullman, Halsted street and tracks.  
Blue Island, State and High streets.  
Bridgeport, 26th and Lime streets.
- I. N.  
McCormick, 26th street and Western avenue, (Union, I. N.).
- L. S. & M. S. (\*Stations are joint with C. I. S.)  
\*Polk street (T), Polk and LaSalle streets, inbound.  
\*Polk street (T), Polk and LaSalle streets, outbound.  
\*Union Stock Yards, (Union, C. J.).  
\*McCormick, (Union, I. N.).  
\*No. 7, (Union, C. B. & Q.).  
\*No. 8, (Union, C. B. & Q.).  
\*Englewood, 62d and Dearborn streets.  
\*Englewood Transfer, 65th street and Michigan avenue.  
\*Grand Crossing, 76th and Chauncey streets.  
\*South Chicago, 92d street and South Chicago avenue.  
Whiting, Front street and tracks.  
Indiana Harbor, Michigan avenue and tracks.  
Gary, Virginia street and tracks.
- M. C.  
No. 1 (T), foot South Water street.  
No. 2 (T), foot South Water street.  
No. 3 (T), foot South Water street.  
Sixteenth street, Sixteenth street and Indiana avenue.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
No. 7, (Union, C. B. & Q.).  
No. 8, (Union, C. B. & Q.).  
Kensington, 115th street and tracks.  
Kensington Transfer, 121st street and tracks.  
Hammond.
- N. Y. C. & St. L.  
Taylor street (T), Taylor and Clark streets.  
Twelfth street, Twelfth and Clark streets.  
Union Stock Yards, (Union, C. J.).  
No. 7, (Union, C. B. & Q.).  
Stony Island, 93d street and Stony Island avenue.
- Solvay, 110th street and tracks.  
Burnham, 136th street and tracks.  
Hammond.
- P. M.  
Harrison street, Harrison and Franklin streets.  
McCormick, (Union, I. N.).  
Union Stock Yards, (Union, C. J.).  
No. 7, (Union, C. B. & Q.).
- P. C. C. & St. L.  
Nos. 1, 2 and 3 (T), Halsted street and Carroll avenue.  
Clinton street (T), Clinton street and Carroll avenue.  
Sixteenth street, Sixteenth and Rockwell streets.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Washington Heights, 103d street and Vincennes avenue.  
West Pullman, 120th and Halsted streets.  
Riverdale, 137th street and tracks.  
Dolton, 142d street and tracks.  
Globe.  
Bernice.
- P. F. W. & C.  
Jackson street, Jackson boulevard and river.  
Dairy House (T), Jackson boulevard and river.  
Van Buren street (T), Van Buren and Canal streets.  
Eighteenth street, Eighteenth street and Stewart avenue.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Englewood, 64th and State streets.  
Park Manor, 69th street and Anthony avenue.  
Grand Crossing, 76th street and Anthony avenue.  
South Chicago, Commercial and Anthony avenues.  
East Side, 100th street and Ewing avenue.  
Whiting.  
Indiana Harbor.  
East Chicago.  
Hammond.  
Hegewisch, 133d street and Mackinac avenue.
- Wabash.  
Twelfth street (T), Twelfth street and Plymouth Place.  
Polk street (T), Polk and Clark streets, (L, 16th street dock).  
A. R. T. Cooler (T), Fourteenth street and Plymouth Place.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
No. 7, (Union, C. B. & Q.).  
No. 8, (Union, C. B. & Q.).  
Western avenue, (Union, C. T. T.).  
43d street, 43d street and Stewart avenue.  
Englewood, 65th and Wallace streets.  
Burnham, 134th street and tracks.  
Hammond.  
Chicago Ridge, 104th street and Ridgeland avenue.
- W. C.  
South Water street (T), foot South Water street.  
Union Stock Yards, (Union, C. J.).  
McCormick, (Union, I. N.).  
Western avenue, (Union, C. T. T.).
- W. & M.  
Taylor street, (Union, C. T. T.).  
Western avenue, (Union, C. T. T.).

## FOREIGN RAILWAY NOTES.

Plans are under way for a railway from Matamba, East Africa, on the bay of Inhambane, southeast to Inharrime, 50 miles. It is understood that orders have been placed for rails and ties.

The Danish State Railways are asking bids for building either a bridge or a tunnel between the islands of Maasnedo and Falster,  $2\frac{1}{3}$  miles. Maasnedo is already connected with the railways on the large island of Sjælland. About \$25,000 has been appropriated for surveying.

A concession has been granted to what are said to be American interests for building a railway from Colonia, Uruguay, a port opposite Buenos Ayres, across the republic to San Luis on the Brazilian boundary. It is planned to connect with a Brazilian railway near Bage.

Italian capitalists have asked for a concession for a railway from a point near Jaffa, Palestine, south to Gaza, and thence to the Egyptian boundary. It is said that lines are also under consideration from Haiffa south along the coast to Jaffa, and from Jerusalem northeast to Es Salt, connecting with the Hedschas Railway.

The Hungarian State Railways some four years ago built great shops four miles outside of Budapest, in which some thousands of men are employed. These have difficulty in finding dwellings, and now the State Railways are establishing a workman's colony, laying out streets, parks and gardens, building a school house and a house for children too young for school, where they will be cared for while the mothers are at work. The first lot of 30 dwellings has been contracted for.

## THE NORRIS LOCOMOTIVE WORKS.

BY C. H. CARUTHERS.

## III.

In 1853, twelve passenger engines, ranging in construction numbers between 628 and 649, were built for the Pennsylvania Railroad. These all had straight boilers, with 30-in. straight domes on the roof sheets, deep fireboxes for wood burnings, springs set almost at the top of the boilers to which they were attached by lugs or brackets at their centers, whistles on independent columns on the waists of the boilers, and all with 16 in. x 24 in. cylinders set horizontally. The driving wheels of three were 72 in. diameter, and those of the rest were 60 in. The framers of the three with high drivers were of slab type throughout at first, while those of the others were slab from the front bumper to the pedestals of the forward driving boxes, and of bar type from that point back. The average weight of all was 58,800 lbs., with 38,000 lbs. on the drivers.

During 1853 and 1854 these were followed by eight 4-4-0 engines for freight service on the Pennsylvania, and two for the Philadelphia & Columbia Railroad of about the same type. These engines differed from the preceding twelve in having the cylinders set at a slight pitch, in using 54-in. drivers on the P. R. R. lot, and in having round sandboxes of almost the same design as used on the standard P. R. R., engines from 1867 to 1881.

In 1854 two 2-6-0 coal-burning freight engines were built

May 4, 1900, so that it will suffice here to refer to the reproduction of an old lithograph of the type, issued by the Norris people at the time, and on which is shown a rather peculiar valve gear that was never applied to the engines; both having the usual Norris "V" hooks and independent half-stroke cut-off shown on the other engines illustrated.

The same year also brought four 4-6-0 freight engines to the Allegheny Portage Railroad, which had the type of valve



Badge Plate on Guides of Norris Bros. Engine of 1848.

The original No. 1 of the Milwaukee & Mississippi Railroad, now Chicago, Milwaukee & St. Paul.

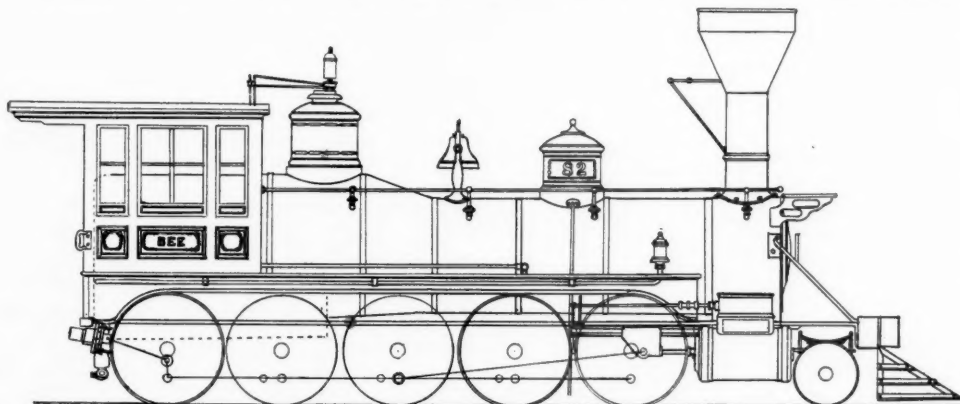
gear shown on "Nittany," and others. These four had 17 in. x 24 in. cylinders, 49 in. drivers, weighed an average of 62,150 lbs., with 42,100 lbs. on the drivers.

In 1856 two very handsomely finished passenger engines of greatly improved design, and with 16 in. x 24 in. cylinders and 66 in. drivers came on the Pennsylvania, and were probably the first Norris engines built with shifting links. This gear was used almost exclusively by the firm thereafter.

Four somewhat similar engines were built for the Philadelphia & Columbia Railroad, about the same time, but for freight service. Their cylinders were 18 in. x 22 in., drivers 60 in., average weight 64,550 lbs., about 40,400 lbs. of which were on the drivers. The cylinders of these were not only set at a slight pitch longitudinally, but had valve-seats sloping laterally at an angle of about 20 or 25 degrees, while coinciding lengthwise with the pitch of the cylinders. This arrangement must have been required by those in charge of the mechanical department of this division of the state road, as it was followed on all en-

gines built for it from 1853 until its purchase by the Pennsylvania in 1852.

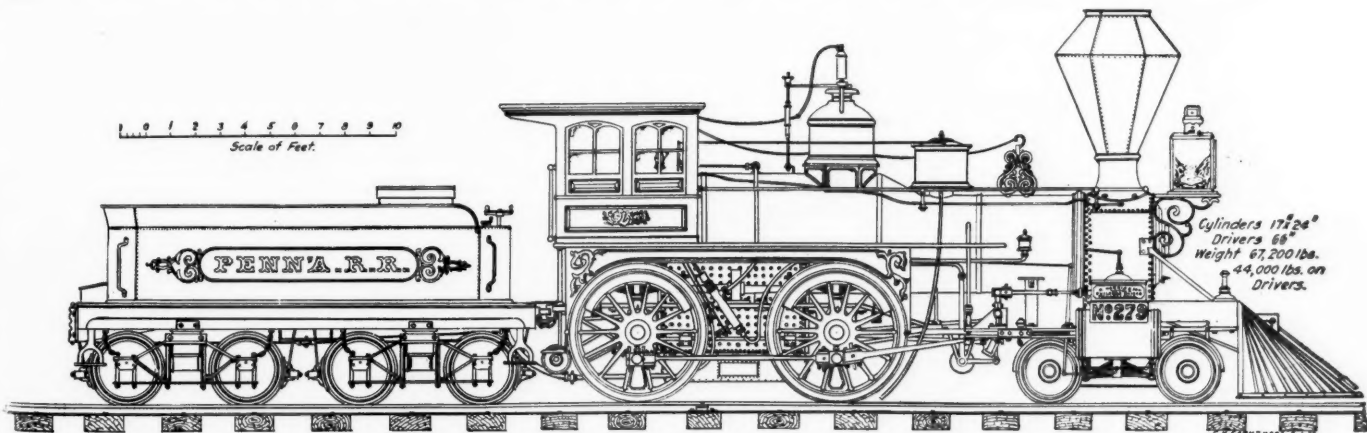
In 1858 the first "Phleger" engines of which I have any authentic record came out of the Norris shops. Some authorities assign 1853 as the year in which the firm began to build this class of engines, and both a woodcut and a colored



The Bee. First Decapod Locomotive.

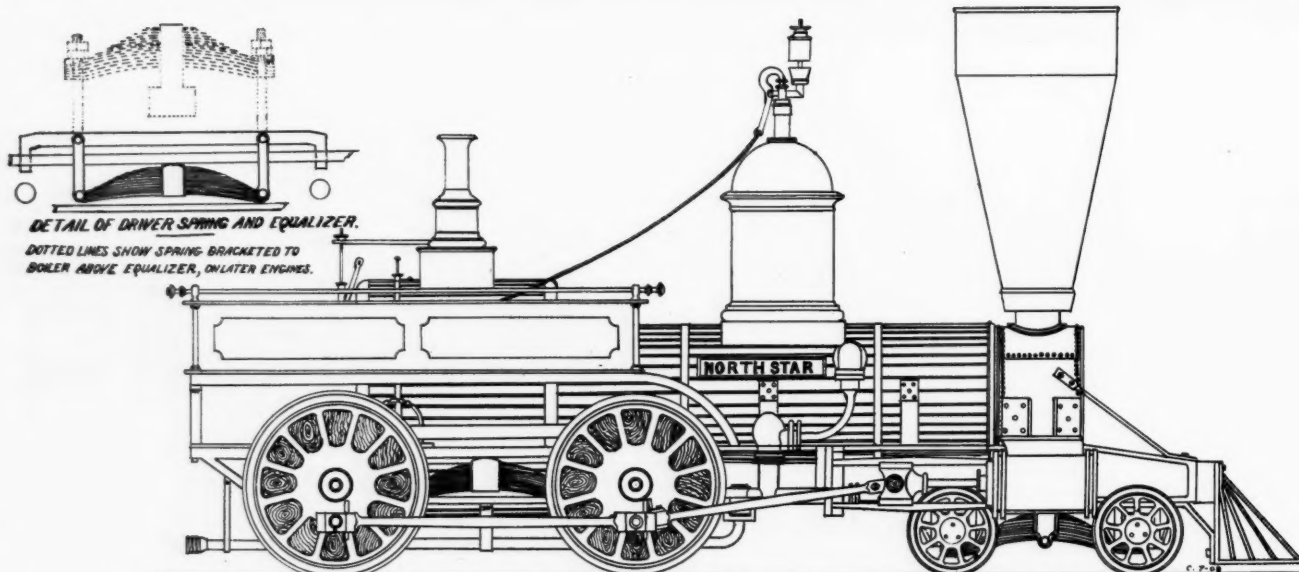
Built for the Lehigh Valley by Norris Bros., 1867.

for the Pennsylvania Railroad, with 17 in. x 22 in. cylinders, 44 in. drivers, and weighing 55,600 lbs., of which 43,800 lbs. were on the drivers. These were a close imitation of the Smith & Perkins engines which had been delivered to the company a short time before. One of these Norris engines was written up and illustrated in the *Railroad Gazette* of



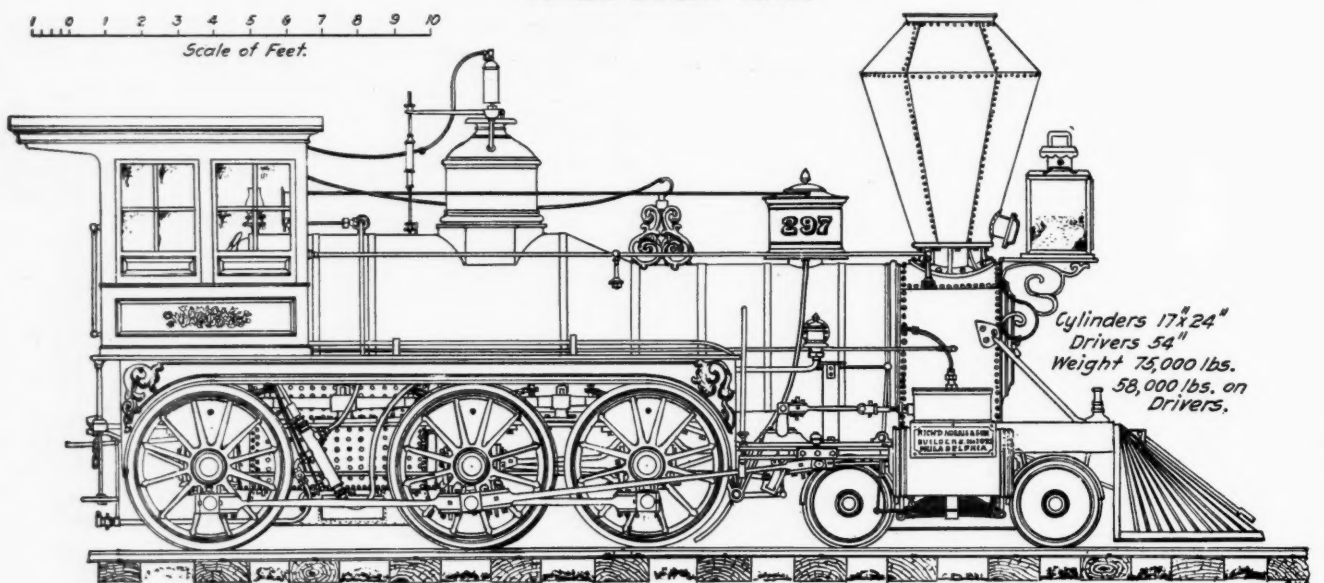
Richard Norris & Son, Passenger Locomotive of 1863.



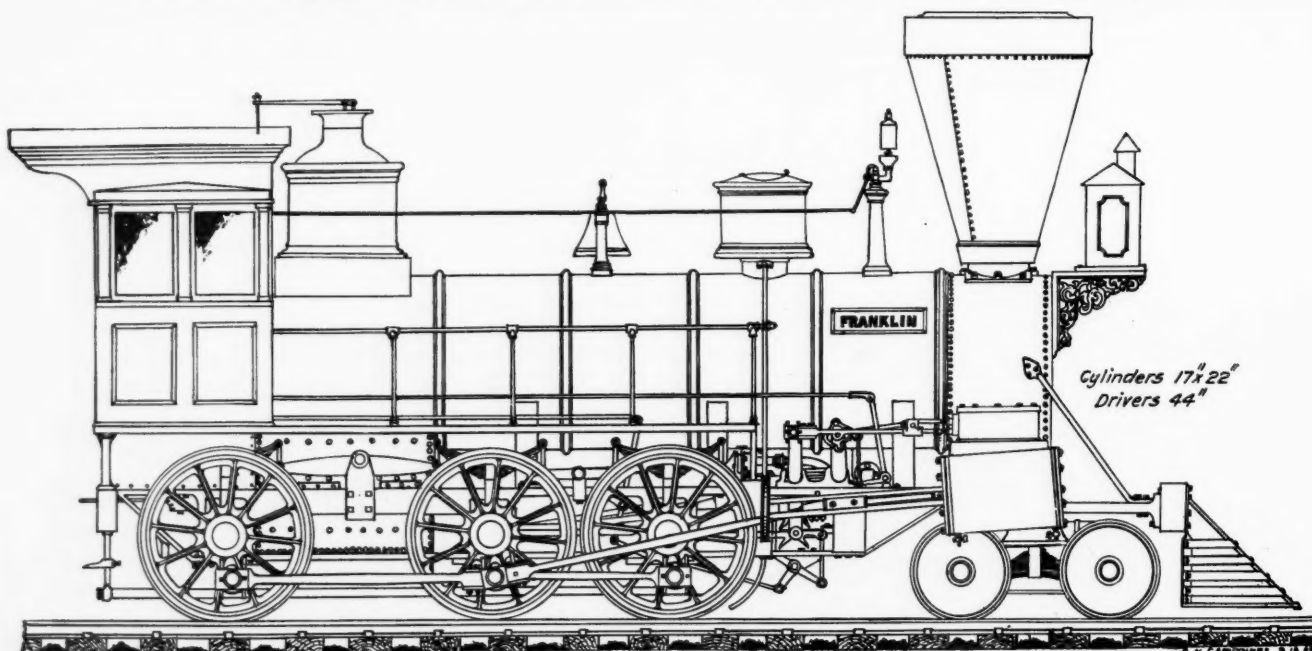


The North Star. Built for Syracuse & Utica Railroad in 1851 by Norris Bros., Philadelphia, with Septimus Norris' Variable Exhaust Valves.

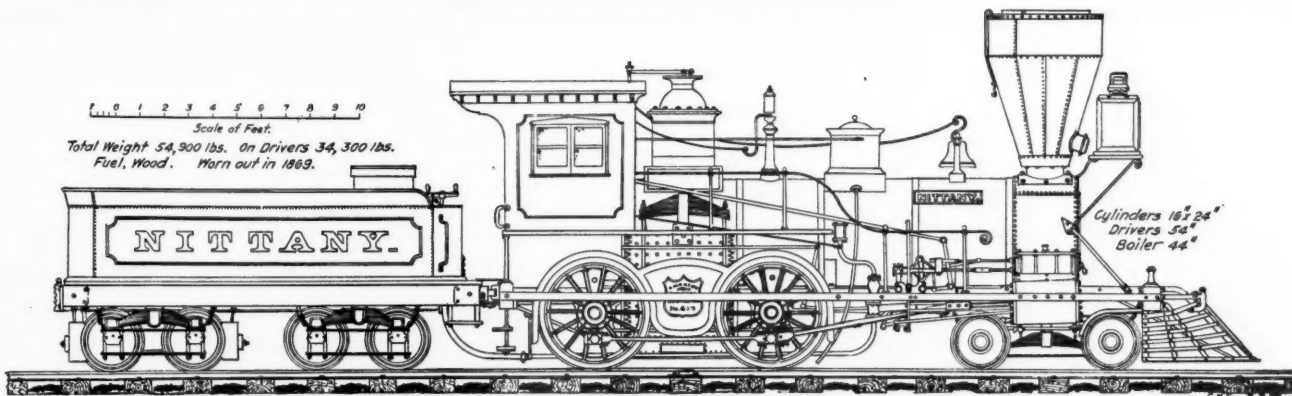
1 0 1 2 3 4 5 6 7 8 9 10  
 Scale of Feet.



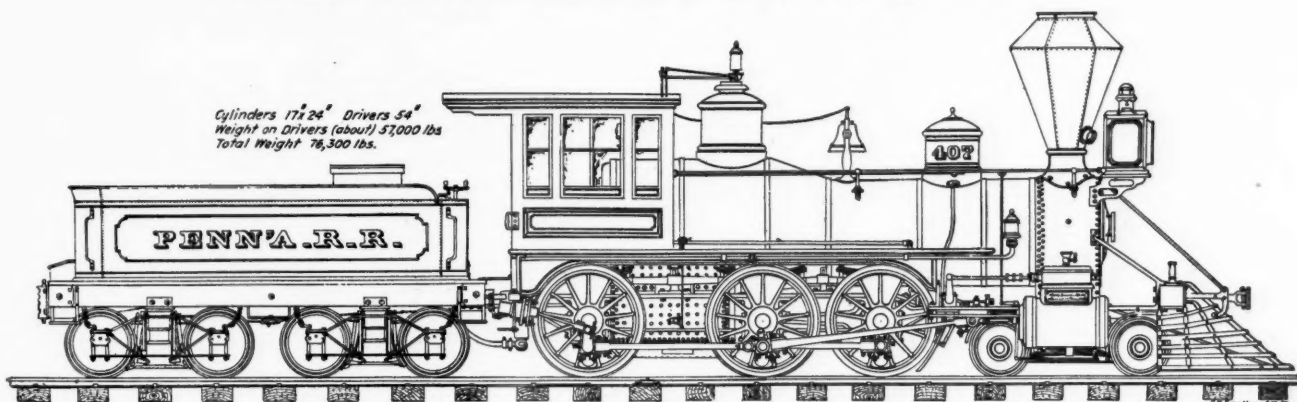
No. 297. (Freight). Built in 1864 by Richard Norris & Son for Pennsylvania Railroad.



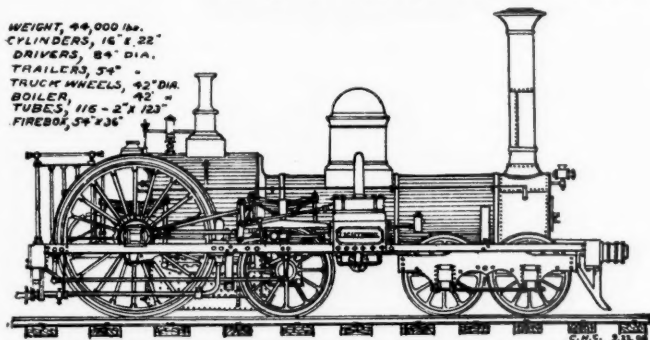
The Franklin. Built by Richard Norris & Son, Philadelphia, about 1853.



The Nittany. Built by R. Norris & Son in 1854, for Pennsylvania Railroad.

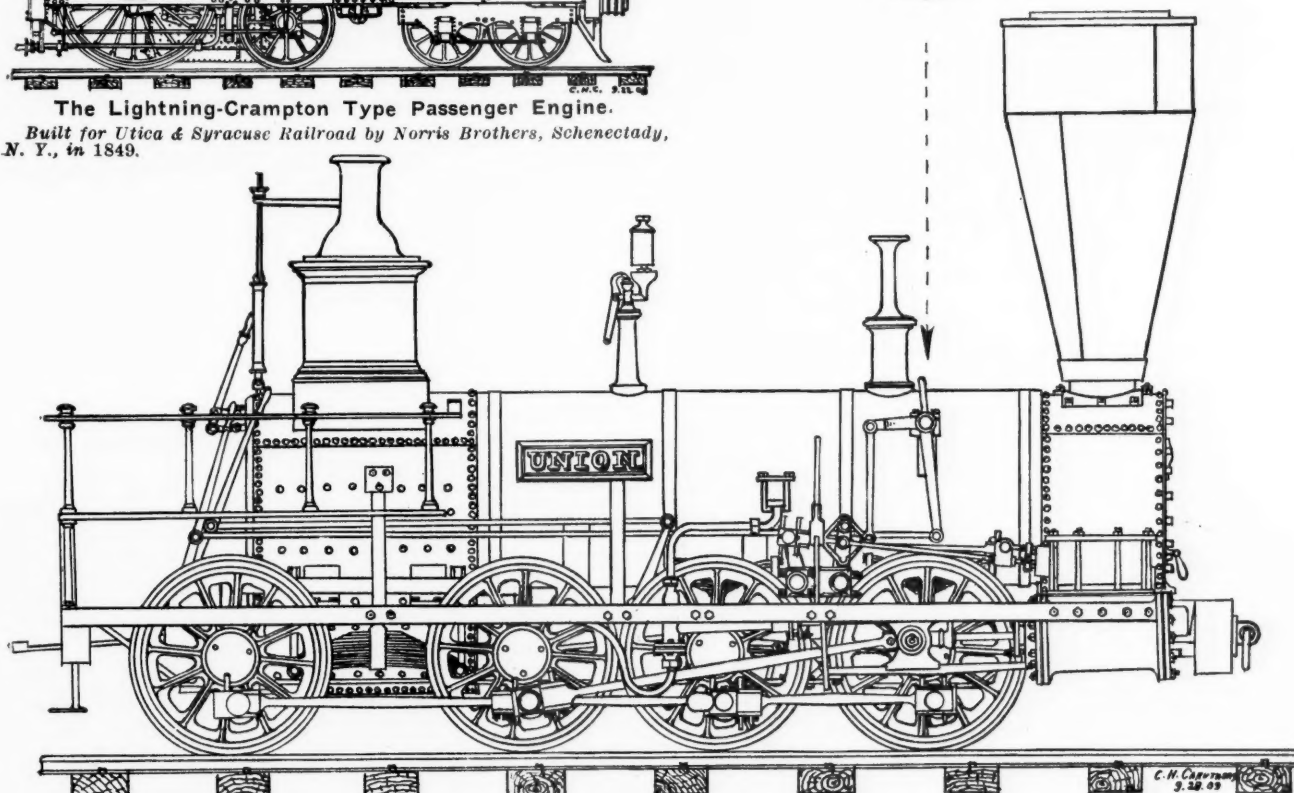
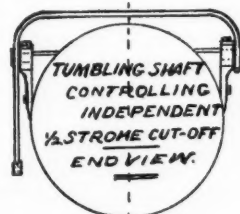


Pennsylvania Freight Locomotive No. 407. Norris Bros., Lancaster, Pa., 1867.



The Lightning-Crampton Type Passenger Engine.

Built for Utica & Syracuse Railroad by Norris Brothers, Schenectady, N. Y., in 1849.



The Union. Eight-Wheel Combined Engine Built by R. Norris & Son, Philadelphia, about 1853.

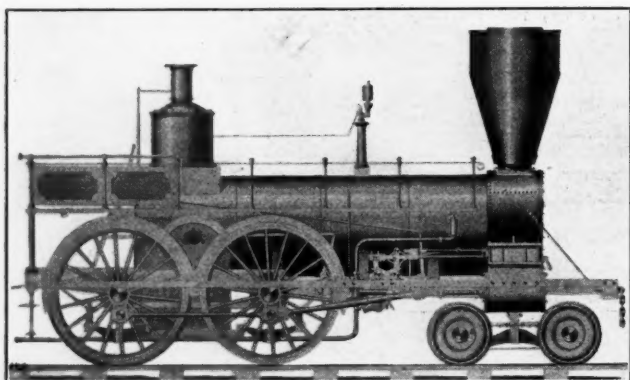
lithograph have been frequently published, in each of which a Norris "Phleger" 4-4-0 passenger engine with a "Bury" dome, without lagging in the first, and covered with polished brass in the second, is shown. The woodcut also shows an engine without a cab, but having the handrails of early days around the foot-plate, while the lithograph shows a cab of the type used by the firm from 1856 to 1860, bearing at the top the name, "Wyoming."

Septimus Norris soon after the advent of the Phleger designed a firebox on somewhat similar lines, but I have nothing reliable to show that it ever passed beyond the experimental stage.

In 1862 R. Norris & Son adopted a type of boiler with an unusually long and high wagon-top in which the dome was

attractive machines—some continuing in service until the later years of the seventies, and one, "Monongahela," afterward No. 59, after being so rebuilt in 1861 continued in regular service until the latter part of 1881.

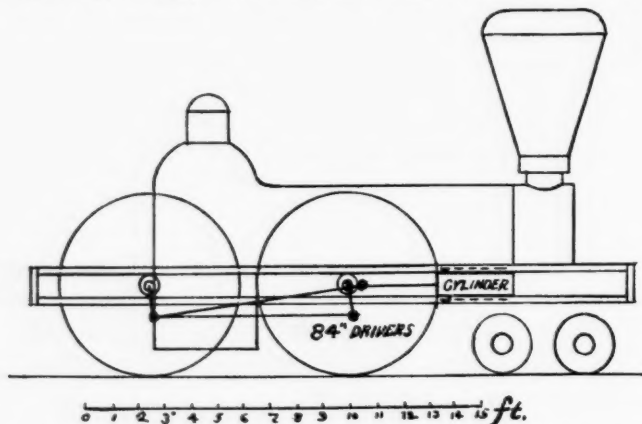
The engines of the Norris works always had a reputation among railway men for speed, although they were generally of rather light construction, and in reading over the annual reports of various companies owning them, one frequently finds under the head of "Remarks" in the performance sheets of engines, "light frames," or "in shop receiving heavier frames." This was especially the case with Norris engines built after 1852, and the boilers of the engines of a still later date were considered by many to be of a somewhat unsafe type of construction. This statement is rather sus-



R. Norris Standard 4-4-0 Passenger Engine, 1853-4.

placed well forward on the roof-sheet. This plan was thereafter followed in the boilers of nearly all engines built by the firm until it closed the Philadelphia plant. It might be mentioned here, that the engines built by Norris Brothers at Lancaster did not have consecutive construction numbers with those of the older plant, but were numbered in a series of their own, beginning with No. 1.

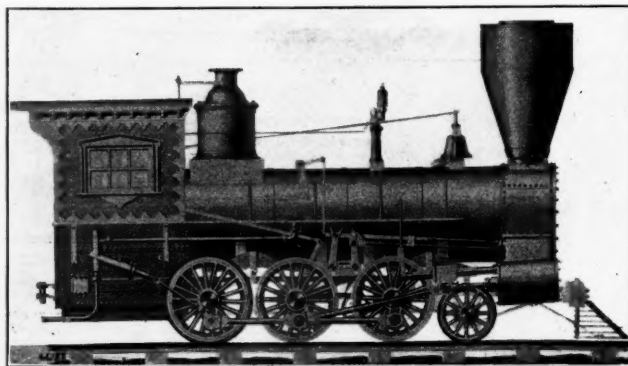
But few, if any, Norris engines remain in existence. The



Locomotive Built by Norris Bros. for Erie, in 1849.

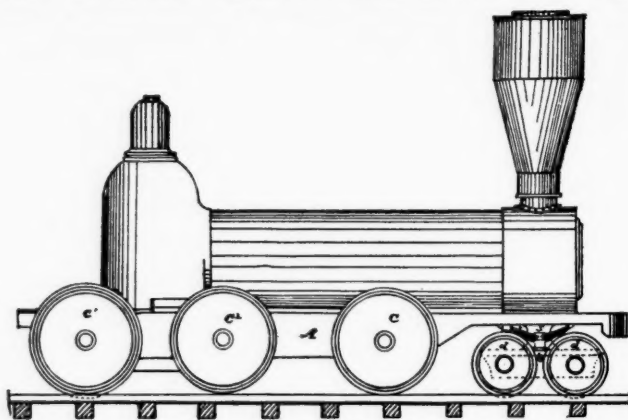
"Washington County Farmer" with the "William Penn" and one or two sister engines, were sold with the state improvements to the Pennsylvania Railroad in 1857 and appear in the company's report for that year under the head of "out of service." The "Farmer" was probably cut up, and the "Penn" was afterward sold to a private line, where it ran until 1864 or 1865, and later came again into the possession of the Norrises, who partially rebuilt it at Lancaster, as described and illustrated in the *Railroad Gazette* on page 167 of August 24, 1907. In 1898 it was standing idle, but in running order, in San Francisco, California.

Quite a number of these built between 1852 and 1856 for the Pennsylvania Railroad and for the two roads of the commonwealth of Pennsylvania, were afterward rebuilt and remodeled by the Pennsylvania and proved very efficient and



R. Norris 2-6-0 Freight Engine Built for the Pennsylvania Railroad.

tained by the following data. About the beginning of 1864 out of 300 locomotives on the Pennsylvania Railroad, 73 were from the Norris plant, and by the end of the next two years, with the equipment largely increased from the shops of other builders, six of the 73 Norris engines had met with disastrous boiler explosions during the preceding eight years, and most of the six were of the later types, while I can find record of but four explosions among the rest of the equip-



S. Norris Locomotive. (Patented 1845.)

ment of the company as stated, from the opening of the road to the time just named.

In the autumn of 1865, one of the Norris "W. T. Co." engines (No. 18), while in apparently perfect condition and almost new, and with plenty of water, blew the entire wagon-top and dome off its boiler while standing attached to a freight train in the yard at Pittsburgh, but fortunately without injuring any of the crew or of the many employees engaged in various duties nearby. The engine was soon repaired with a new roof-sheet of slightly different outline, but the remaining twenty-one were promptly taken to Altoona Shops and had additional stays placed in their boilers.

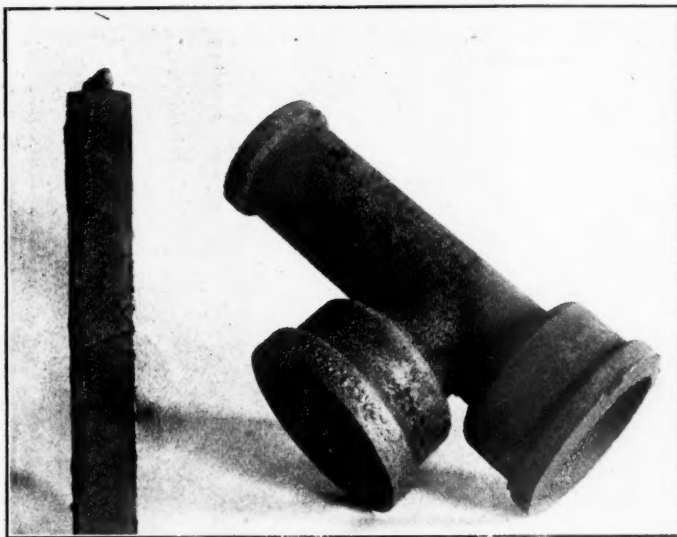
The accuracy of much of this article is certainly due to J. Snowden Bell, Esq., Herbert T. Walker, the Baldwin Locomotive Works and the Franklin Institute of Philadelphia,



for the use of valuable drawing, publications and other data bearing upon the subject, and without which assistance so willingly rendered, much would have had to be omitted as vague or uncertain. I might also add that since completing the article, I have ascertained from John Baumgardner, of Lancaster, Pa., who was employed as a draughtsman with Norris Brothers during their brief stay in that city, that the firm was then composed of Messrs. James, Edwin and Cassandra Norris, with John A. Durgin as superintendent.

#### THE PERMANENT MOLD AND ITS EFFECT ON CAST IRON.\*

Some four years ago cast iron was selected as the material best adapted for use as a permanent mold. In the course of the investigations, it was noticed that certain of the castings when cool were soft while others were hard, in fact, chilled white, the hard castings being in an overwhelming majority. As a remedy, various mold coatings of inert materials were used, but it was found that while certain of these coatings gave very good results when applied thickly, they delayed the process. In an effort to gain time the coating was neglected, and it was ascertained that when working at good speed, the major portion of the castings were soft and could easily be



Sand Mold Castings.

machined. When the coating was discarded and the castings poured and removed from the mold as soon as they had solidified sufficiently to handle, the total production was soft castings. After some 14,000 or 15,000 castings had been made under every condition that could be obtained in an ordinary foundry, the following bases were established:

- (1) Molten cast iron does not chill (using the word "chill" to express hard, white crystals) until after it has solidified.
- (2) Chilling molten iron swiftly to the point of solidification, and then allowing it to cool normally, produces a homogeneous metal.
- (3) This homogeneous metal possesses certain characteristics that are entirely absent when the same molten iron is poured in sand and allowed to cool in the mold.
- (4) The chemical constituents of the iron, with the exception of carbon, have little or no effect in modifying these characteristics, when gray iron, within ordinary limits, is used.

Inasmuch as all work we have done has been in sections ranging from 2 in. to  $\frac{1}{8}$  of an inch, the results obtained must be considered in direct comparison with those obtained when these same sections are cast in sand. The casting so low in silicon that it will form white crystals when made in sand, will inevitably form the same white crystals if cast in a permanent mold, even though treated by the process outlined above. This applies principally to thin sections. The ex-

tent to which this process can affect thick sections depends entirely upon the ability of the investigator to rob the molten mass of its heat.

Molten cast iron is a solution of carbon in iron, with the addition of silicon, phosphorus, sulphur, manganese and certain impurities forming a homogeneous, fluid mass. If this mass can be cooled instantly, it will still be homogeneous, the different elements not having time to segregate. Instant cooling is clearly impossible, but we find that swiftly chilling the molten mass produces practically the result desired. The molecular action of forming white, hard crystals is only started. When the casting is removed at a bright, yellow heat, with the interior still molten, this molecular action—which is a continued closing together of the particles—compresses the molten iron to such an extent that globules of iron exude through the pores and form small excrescences on the surface. This is further shown by the fact that when iron is cast in long bars, these bars do not pipe, but the molten iron moves towards the top of the bar, which is partially molten, and forms excrescences at the top. This is exemplified in the accompanying illustration. Since the cooling medium, i.e., the iron mold is removed at the point of solidification, there is no further tendency toward forming large crystals and segregation is prevented by the rapidity with which this chilling action is performed. We have tried to reproduce this effect in sand molds, but with no success.

Fig. 1 shows a broken section of a casting, one side of which was retained in the mold long enough to produce the white crystals, while the other side is soft gray iron. This clearly proves the first proposition. Fig. 4 is a section from another casting, which was taken from the mold when the point of solidification was reached and was allowed to cool normally. Fig. 5 shows a section of the same casting taken from a mold at a bright red and quenched in water. All of this iron was poured from the same ladle. The analysis of this iron is:

Sil. ....	2.12	Man. ....	.38
Sul. ....	.098	T. C. ....	3.49
Phos. ....	.70		

Fig. 1 is useless as a casting, showing white crystals on one side and dark gray on the other. Fig. 4 is clean, soft, easily machined and is as nearly homogeneous as can be shown by any test we can devise. It has a dark gray fracture, machines cleanly, the chips being free from fine dust, and does not show the usual hard scale on the exterior. When heated to a bright red or yellow heat and quenched in cold water, it has a very light gray fracture and is as hard as tempered tool steel. When used as a cutting tool it will outlast any ordinary high-carbon steel. Bring it in contact with a working dynamo after hardening, it becomes a permanent magnet. It does not possess the disadvantage of increasing in bulk when repeatedly heated and cooled. This was illustrated by a casting that had a distortion of but .002 of an inch after being brought to a bright red heat and quenched in cold water, the operation being repeated 10 times. Once having imparted to the iron the properties enumerated above, it is impossible to remove them except by remelting. If Fig. 4 be held in a bright flame until metal drips from the end, the remaining iron will be unchanged in every particular, with the exception of a slight coating of oxide.

Fig. 5 shows a light gray fracture, and is an exact duplicate of Fig. 4 hardened. When heated to the temperature at which it was hardened and allowed to cool normally, it reverts to the characteristics of Fig. 4. This heat need not be long continued; the more heating to the proper temperature is sufficient to accomplish the result.

Figs. 6 and 7 are from the same mold. The analyses:

No. 6.		No. 7.	
Sil. ....	2.94	Sil. ....	1.75
Sul. ....	.032	Sul. ....	.07
Phos. ....	.028	Phos. ....	1.42
Man. ....	.38	Man. ....	.41
T. C. ....	3.08	T. C. ....	3.22

\*From a paper by E. A. Custer before the American Society for Testing Materials, June 30, 1909.



Fig. 1.



Fig. 2.

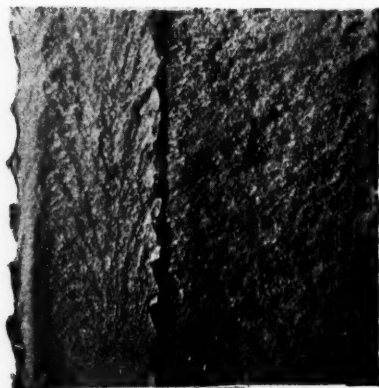


Fig. 3.

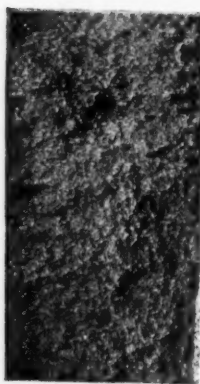


Fig. 4.

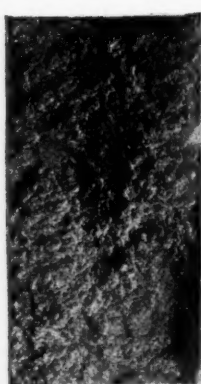


Fig. 5.



Fig. 6.

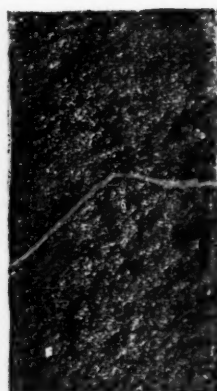


Fig. 7.



Fig. 8.



Fig. 9.



Fig. 10.



Fig. 11.



Fig. 12.



Fig. 13.

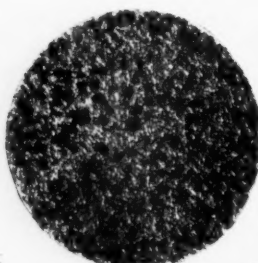


Fig. 14.

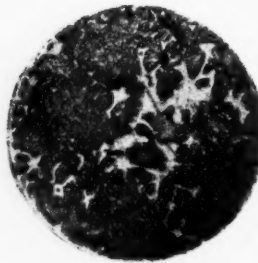


Fig. 15.

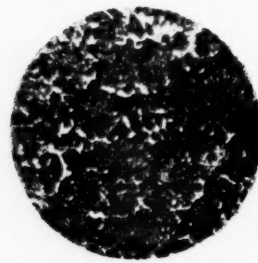


Fig. 16.



Fig. 17.



Fig. 18.

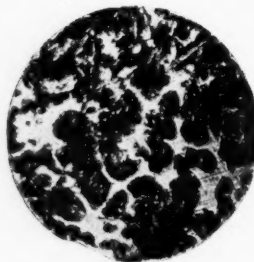


Fig. 19.



Fig. 20.



These present precisely the same phenomena as Figs. 4 and 5, so far as any tests applied will show.

It would seem, from the analyses of the treated samples, that the peculiar properties observed are entirely independent of the silicon, sulphur or phosphorus being high or low, at least within the limits noted. It is immaterial whether the silicon is 1.75 or 3 per cent., the sulphur, .02 or 12 per cent., or the phosphorus 1.50 or .03 per cent., in any event the same practical result is obtained if the process outlined is correctly followed. In no respect have we been able to duplicate these results when the same iron was poured into sand molds of like dimensions.

The logical explanation of this hardening property is that the molecular action, which produces a homogeneous metal by chilling molten iron to the point of solidification, is again the medium of producing the extreme hardness. The first chilling brings the molecules to what might be termed a receptive position. Removing the chilling medium holds this position, and as the temperature falls the molecular position becomes permanent. If at the receptive point the casting be quenched in cold water, the great unmeasurable force of heat expansion and contraction is brought into play. No one knows how much pressure per square inch is exerted when molten iron cools. This force is always greater than the tensile strength of the material under treatment. If the semi-solid iron be subjected to this presumably enormous force exerted through the mold swiftly robbing it of its heat, it probably follows that the molecules are crushed together with an enormous pressure, and an extremely dense structure results. If the casting be quenched in oil, there is no hardening effect. If thrown into boiling water, it cracks into pieces.

Fig. 3 is the fracture of an ordinary forged and hardened steel file placed alongside of hardened cast iron, in this case Fig. 5. The analyses:

File.		Cast Iron.	
Sil.	.19	Sil.	2.12
Sul.	.022	Sul.	.098
Phos.	.019	Phos.	.70
Man.	.25	Man.	.38
T. C.	1.28	T. C.	3.49

This photograph shows very clearly the coarse grain of the cast iron and the metal flow of the steel file, yet the cast iron is the harder metal. Fig. 8 gives a very good idea of the difference between casting in sand and in a permanent mold. This fracture is of the same iron that was used for 1, 4 and 5, and was cast in a green sand mold and allowed to cool normally. Figs. 2, 11 and 18 are microphotographs of Figs. 4, 5 and 8, and present a very fair field for discussion. They were etched with picric acid, and each given a magnification of 104 diameters. The fracture photographs are given a magnification of 2½ diameters.

In this work carbon plays a large part, although it does not seem to have the same effect as when iron is cast in sand. Since all the carbon in molten iron is in solution and exists in the combined form, then, if molten iron be instantly cooled to 1,000 deg. Fahr., all the carbon will be held in the combined form. If, however, it be instantly cooled to the point at which the iron sets, and then allowed to cool normally, the carbon will be in the combined form at the time of setting, but will change to the free form as the cooling progresses. This formation of free carbon is very rapid; the major portion present in the casting is formed within a few seconds after it is taken from the mold. The analyses below give a very fair idea of this action, the pieces in question being 6 in. x 1¼ in. x ½ in.:

	C. C.	F. C.	Sil.
Cast in sand and cooled normally.....	.21	2.93	2.61
Taken from permanent mold at bright yellow and quenched .....	1.50	1.52	2.61
Taken from permanent mold at bright red and quenched .....	.49	2.61	2.61

It will be seen from this that two-thirds of the combined carbon has been changed in the few seconds required to cool from a bright yellow to the bright red. The free carbon in all

these castings is not in the form of graphitic carbon, as we usually see it in ordinary cast iron, but partakes more of the character of annealing carbon, as exhibited in a malleable casting. Here we have an iron containing 2.61 silicon and 2.50 free carbon that possesses the property of taking a temper equal to tool steel, and this without the least indication of what is generally termed "chill."

At this writing the tensile strength is under investigation. The scope of this research is very large, and many elements must be taken into consideration. Our results so far indicate that cast iron, when chilled in a permanent mold to the point of setting and then cooled normally, is greatly increased in tensile strength, and that this strength does not materially vary within the chemical range of ordinary foundry iron. The thickness of the section and the initial heat of the casting have the most influence in determining the ultimate strength, and these variations call for an extended consideration.

Fig. 6 shows a fracture of high, low sulphur iron, while Fig. 7 is that of a low silicon, high phosphorus iron. Figs. 11 to 18, both inclusive, show iron cast in permanent molds, the metal being hard, as in Figs. 5, 6 and 7. Fig. 19 shows the same iron as Fig. 4, but cast in sand.

Heretofore cast iron has had a rather poor reputation, being generally unstable and yielding reluctantly to any treatment that would tend to improve the quality. The permanent mold has done valuable service in demonstrating that the simplest of simple heat treatments endows it with characteristics that entitle it to a very large portion of the consideration that has hitherto been enjoyed by wrought iron and steel. One hardly dare say that the ultimate possibilities of this metal have been reached, nor can it be considered in the light of an unstable and refractory medium. On the contrary, it answers readily and surely to the proper treatment. The field is wide, and gives promise of much that would place cast iron on a far higher plane than it occupies to-day. The writer acknowledges the keen interest and self sacrificing help of Mr. Robert A. Pitman, without whose devoted work much of what has been accomplished would have been lost.

#### DETROIT RIVER TUNNEL LOCOMOTIVE.

A series of acceptance tests have been completed recently by the General Electric Co. and the Detroit River Tunnel Co., jointly, upon electric locomotive No. 7500—the first of six locomotives to be operated by the Michigan Central in the tunnel under the Detroit river. The electrical equipment of this locomotive, the most powerful ever designed for operation by direct current, was built and installed by the General Electric Co. The mechanical equipment is the product of the Schenectady works of the American Locomotive Co.

The electrified zone embraces the tunnel with its approaches, terminal tracks and sidings, about six miles. Maximum grades are encountered on the approaches, 2 per cent. grades extending for about 2,000 ft. at each end of the tunnel.

The locomotives are designed for hauling both freight and passenger traffic through this tunnel and also for switching service at the terminals. The specifications demand as maximum service the hauling of an 1,800-ton trailing train, on the 2 per cent. grade, at a speed of not less than 10 miles per hour, with two locomotives in multiple unit. Their capacity is such that they are capable of repeating trips with this weight of train continuously with a lay-over of 15 minutes at each end.

The locomotive is an articulated 0-4-4-0 type, weighing 200,000 lbs. and equipped with four GE-209 motors.

The truck side frames are heavy steel castings of a truss pattern. To get the necessary weight on drivers, the members of this frame are made heavier than actually required for strength, the top member having a section of 5 in x 7 in.,



while the other members are proportionally heavy. End frames and bolsters are castings of heavy box girder types, rigidly bolted to the side frames and fitted in such a manner as to relieve the bolts of shear. Draft gear buffers and all truck frame members are calculated for buffing stresses of 500,000 lbs. and hauling stresses in proportion.

The suspension is of the locomotive type, the weight being carried on semi-elliptical springs resting on the journal box saddles. The system of equalization by which these springs are connected together is novel. The "A" end of the running gear—that is, what may be called the forward truck—is side equalized, the two springs on each side being connected together through an equalizer beam. This equalizes the distribution of weight between the two wheels on one side, giving to this truck a two point support and consequently leaving it in a condition of unstable equilibrium as regards tilting stresses—that is, stresses tending to tip the truck forward or backward. The "B" end of the running gear, or the rear truck, is cross equalized, the two springs on the rear axle being con-

to comply with the railway company's specifications. This draft rigging, as well as the spring buffers, is mounted upon the outer end frame of the truck—an arrangement which insures that all hauling and buffing stresses are transmitted on the same horizontal line through the draft rigging, side frames and hinge pin of the locomotive and, therefore, the center pins and platform framing are entirely relieved of all stresses except those due to weight of cab, platform and equipment.

The center pin on the "A" end is a swivel pin, having a turning motion only, while that on the "B" end has a turning and a sliding motion. This construction allows the longitudinal motion necessary to take care of the variation in distance between the truck center pins occurring as the locomotive passes around curves. The side bearings on the "A" end have a clearance of about  $\frac{1}{8}$  in. when the cab is standing symmetrically, while those on the "B" end have a clearance of about  $\frac{1}{2}$  in. The result of this arrangement is that, under ordinary circumstances, the cab is carried on a three-point suspension, since the side bearings on the "A" end support all



Detroit River Tunnel Locomotive.

nected together through an equalizer beam. The other two springs on this truck are independent and are connected directly to the truck frame. This results in a three-point suspension on the rear truck, leaving it in a condition of stable equilibrium, capable of resisting stresses in any direction, whether rolling or tilting. The two trucks are coupled together by a massive hinge, so designed as to enable the rear truck to resist any tilting tendency of the forward truck. The two trucks are thus combined in a single articulated running gear, having lateral flexibility with vertical rigidity, and the running gear has what may be called a compound three-point suspension.

The braking equipment is mechanically independent on each truck. Two pairs of 12-in. brake cylinders apply the brakes, and separate valves and cutout cocks are supplied, so that the pair of cylinders controlling either truck may be cut out without affecting the other.

The draft rigging consists of a standard M. C. B. vertical plane coupler with yoke, springs and follower plates, designed

normal rolling actions of the cab, the side bearings on the "B" end coming into play under abnormal conditions only.

The cab platform is built of four 10-in. longitudinal channels running the whole length of the locomotive, tied together by the end channels and bolster plates. Such ballast as is necessary to bring the weight of the locomotive up to the required amount is bolted to the two center sills, and the space remaining between them forms a passage leading from the blower to the motors for carrying the air for forced ventilation. A floor plate, consisting of two sheets of  $\frac{3}{8}$  in. steel, is riveted to the platform sills and serves to stiffen and square the platform framing. In the operating cab a  $\frac{1}{8}$ -in. wood flooring is placed over this steel floor.

The side and ends of the cab are  $\frac{1}{8}$ -in. steel plate, supported by a frame work of small angles, while the roof is No. 8 steel. The main operating cab occupies the central portion of the locomotive and covers a floor space of 15 ft. 6 in. x 10 ft. It is supplied with ample windows allowing a practically unobstructed view in every direction. Auxiliary cabs extend from

the main cab to the ends of the locomotive, and occupy a floor space of 9 ft. x 6 ft. each. These cabs house the air tank, sand boxes, rheostats and contactors. Hinged perforated doors in the sides of the auxiliary cabs give access to the rheostats and the connections back of the contactors, while folding doors between the auxiliary and main cabs allow access for inspection of the contactors. The auxiliary cabs are bolted to the platform and main cab, so that they can be readily removed when it is necessary to make more serious repairs.

One marked advantage is the unobstructed view given the engineer. It will be observed that the entire absence of cab directly in front, combined with the low roof of the auxiliary cab, allows him a clear view of the train behind and of practically the entire right of way ahead.

A type C-79 controller and the operating handles for the air brakes are located inside of the main cab at the engineer's seat. Sander valves are located beside the engineer, and over his head are switches for the headlight and controller circuits. Directly in front are illuminated air gages, ammeter and a foot operated trolley valve for raising and lowering the overhead trolley. Sanders are arranged to sand the rails in front of the leading wheels on either truck.

A CP-26 air compressor is located in the center of the main cab. This is a two-stage, four-cylinder compressor, geared to a 600-volt d.c. series motor. The compressor has two low-pressure and two high-pressure cylinders, so arranged as to

loads that the motors will be called upon to carry. In large sizes of motor equipments, with a gear and pinion at only one end of the shaft, it has been often claimed that a large proportion of the wear and breakage of pinions is due to the tilting of the motors under heavy loads, which concentrates the pressure at one end of the tooth. The form of construction adopted in the Detroit locomotive will eliminate any such danger.

The motor is designed for forced ventilation. Air is delivered into the motor frame at the end furthest from the commutator, passes between the field coils and around the armature, and finally escapes through suitable discharge openings over the commutator. The blower used for this purpose has a capacity of 2,000 cu. ft. of air per minute at  $2\frac{1}{4}$  inches water pressure, and is driven by a direct current series motor. This blower delivers air to the passage between the two center sills above described, the ventilating ducts being tapped off to the motors at appropriate points.

The control system used is the Sprague-General Electric multiple unit control, with two master controllers in the main cab and the contactors in the auxiliary cab. Multiple unit connections have been supplied, so that three locomotives may be operated in multiple unit if necessary. The problem of starting and accelerating a train of from 1,000 to 1,500 tons, which may consist of 40 or 50 cars, is a rather delicate one. Such a train is not a rigid mass, but a long elastic body, and any inequality in the starting torque results in a series of jerking and buffing strains which are very likely to reach abnormal values in some parts of the train. Consequently the control for this locomotive was designed especially to produce a uniform increase of speed and torque during the period of acceleration. The control combinations are arranged so that the motors may be operated four in series, two in series and two in parallel, or four in parallel. There are nine resistance steps in series, eight in series-parallel and seven in the parallel position.

The accompanying diagram is a good illustration of the results obtained by this control. It shows the speed, current and tractive effort curves obtained in the acceleration of a train of 1,578 tons, consisting of the locomotive and 26 freight cars, from a standstill to 10 miles per hour. It is to be noted that the maximum increase of the drawbar pull is about 6,500 lbs. on the first few steps, after which the maximum throughout the remainder of the acceleration is from 2,000 to 3,000 lbs. The practical effect of this smooth acceleration appears to an observer standing in the caboose of such a train, in that the rear end of the train is started so gradually that the beginning of the motion is almost imperceptible.

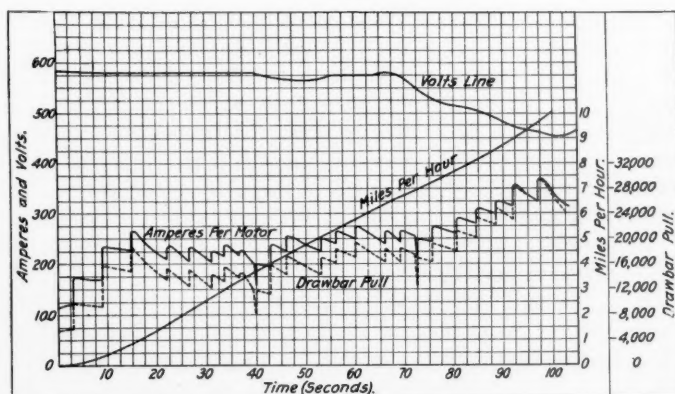
The locomotive is equipped with third rail shoes to take current from an inverted third rail. It is also fitted with an overhead trolley, which, as stated above, can be raised or lowered by a foot operated valve in front of the motorman.

The general specifications of the locomotive are as follows:

Number of motors	4
Gear ratio	4.37
Number of driving wheels	8
Diameter of driving wheels	48 in.
Total wheel base	27 ft. 6 in.
Rigid wheel base	9 " 6 "
Length, inside knuckles	39 " 6 "
Length of main cab	15 " 6 "
Height of cab	12 " 6 "
Maximum height, trolley up	15 " 6 "
" height, trolley retracted	14 " 10 1/2 "
" width	10 " 2 5/8 "
Width of cab	10 " 1 1/8 "
Total weight	199,000 lbs.

$$\frac{\text{Weight}}{\text{Normal tractive effort}} = 5.62$$

From this it appears that the ratio between the tractive effort and the adhesive weight is considerably greater than that obtaining on steam locomotives, and more nearly approaches that existing between the tractive effort and the total weight of engines of the Atlantic type.



Acceleration Test; Detroit River Tunnel Locomotive.

divide the work of compression into four equally distributed impulses per revolution. It has a capacity of 100 cu. ft. piston displacement per minute when pumping against a tank pressure of 135 lbs. Ample circulating pipes are provided for cooling the air between stages and between pump and tanks in order that the temperature may be maintained at a moderate value. The compressor is controlled by a governor, consisting of a pneumatically operated piston controlling the contact of the motor circuit switch, and so arranged as to close or open this circuit at any predetermined limits of pressure.

The GE-209 is a standard General Electric box-frame motor of the commutating pole type and has a rating of approximately 300 h.p. At its one hour rating the motor will develop a torque of 4,050 lbs. at a one-ft. radius. The gearing between motor and axle has a 4.37 reduction, and the driving wheels are 48 in. in diameter. With this reduction each motor will develop a tractive effort of 8,850 lbs. at the rail head, which gives a total tractive effort for the four motors of 35,400 lbs. at 12 miles per hour. The motors have an overload capacity sufficient to slip the driving wheels, and the locomotive can develop at the slipping point of the wheels an instantaneous tractive effort of 50,000 to 60,000 lbs. The maximum speed of the locomotive running light on a level track is about 35 miles per hour.

There are two gears and pinions per motor, one at either end of the shaft. This form of construction was used on account of the unusually heavy torque and the excessive over-



## HOW TO BE A FIRST-CLASS TRAINMASTER.

SECOND PRIZE ARTICLE.\*

BY J. J. PRUETT,

Trainmaster, Vandalia Railroad; St. Louis Division, Terre Haute, Ind.†

To be a first-class trainmaster one must put aside all thought of personal gain or advancement and enter into the work with only the thought in mind to increase the efficiency of his department. To attain this high position, three important and primary qualifications are necessary.

First—The man must be a student; the line of thought to embrace human nature, physical condition of the railway, composition and character of the other staff officers, and last, but not least, his own faults; and he must be manly enough to admit and correct such faults when once they are discovered.

Second—He must be an organizer; competent to manage men. In employing men he should select and educate them, bearing in mind the one principle, that these men whom he selects will have charge of the future transportation affairs of the American railways. The superintendent will expect the trainmaster to be a man who can assist him in harmonizing the different departments; uniting them as an agreeable body to move traffic in a manner satisfactory to the public and to the company.

Third—He must be an honorable man, and an example to the men of loyalty, honesty and integrity, and in so being, he will command their respect. In imposing discipline he must be a man to appreciate the principles of the Golden Rule.

Having outlined, in a general way, the character and principles of the man necessary to the position, we will presume such a one has been selected and he is given the opportunity to develop his natural abilities.

First—His student ability will be brought into requisition, and if he is not of studious habits he may as well retire from the race at once. A careful study and analysis must be made of the personnel of his own department that he may become familiar with the character and habits of the men. Too much importance cannot be attached to this particular feature as the information is necessary to satisfactorily handle the men in a way to bring about best results.

Next in order is the nature of the traffic to be handled: The amount of passenger service to contend with, the proportion of freight to passenger earnings, and to what extent one can be sacrificed to the other. Power and equipment must be analyzed; its condition, location and size carefully noted; engines properly distributed to insure prompt movement of trains and at the same time a sufficient number turned in to the mechanical department to insure keeping a maximum amount of the power in good working condition. Trainmasters too often overlook the mechanical department in the distribution of the power, and feel that if they can keep the engine away from the shop, they are gaining a point at the expense of that department. They, however, are awakened to this error, too late, as the condition of the power has got beyond control. Treat the mechanical department fairly, and you will be the benefited officer. Do not blame them for bad power when you alone are responsible.

The car supply must receive careful attention. The traffic department should be consulted as to its requirements, and a most systematic method of distribution effected. The prompt delivery of the empty to a shipper is one very important factor in soliciting business.

\*The first prize article was printed last week. Second prizes of \$50 each were awarded to two articles; that here given, and another which is to appear next week.

†Mr. Pruett's railway service has been wholly on the Vandalia Railroad; baggage master (four years), fireman, shop clerk, telegrapher (five years), yard clerk, yard master, assistant trainmaster and trainmaster. He began 23 years ago, and he has been a trainmaster for four years.

The profile of the railway must be given careful study. The trainmaster, as well as the division engineer, must familiarize himself with the physical characteristics of the division, and must assist the division engineer in maintaining an efficiency equal to the traffic handled. This is to be accomplished by educating the transportation employees to observe, and report promptly, if irregular, condition of track or signals, and all other appliances affecting train movements; such reports to be transmitted to the division engineer by the trainmaster in a manner that will not become irritating to him.

The details mentioned above are the stock in trade of a trainmaster and with them he must make or break his reputation. After they are mastered he should not conclude that his duties are at an end, but should take up the higher subjects of transportation; one of which "speed and tonnage" should be harmonized. This feature depends entirely upon revenue conditions. No set rule can bring about the desired result. The auditor's report of earnings and expenses must be analyzed; competition and the nature of traffic considered; after this your carefully prepared recommendation for equalizing the two, submitted to the superintendent for approval, bearing in mind earnings and expenses vs. competition, which are the prime factors he will consider.

While these elementary studies have been occupying the attention of the young student trainmaster, traffic has been moving in its accustomed groove, and, in his opinion perhaps, in a satisfactory manner until one day he is awakened from his dream by receiving his first criticism from the superintendent in the form of a letter to the effect that the "overtime is abnormally high." Why? \* \* \* "I notice that during the past month passenger train movement was delayed by—engine failures, block lights and switch lights not burning; also, a very decided increase in petty accidents. Please investigate and advise."

With these criticisms in mind the trainmaster begins to investigate the causes. These investigations will open up an avenue for application of his second qualification—generalship. By reason of his ambition, energy and meager experience in the position, he has consoled himself with the idea that he is doing as well as his predecessor; but this first blow dispels the illusion and he discovers the thing he at least expected; finds petty jealousies existing between the yards and the car department; between the mechanical and transportation departments; between the train and engine men, and between the despatchers, operators and road men. He cannot afford to make public his findings, as they are his own battles. No doubt, the superintendent is fully aware of the conditions, and, knowing they exist, appointed this particular man to assist him in eradicating the evils and is watching the result of his appointment.

The remedy is with the trainmaster, and the obtaining of the result which the superintendent anticipated will thoroughly test his ability as an organizer, and in addition, he will need be, to a certain extent, a lawyer, an entertainer, a teacher and an orator. As such, he must secure the co-operation of the heads of the different departments, and this joining of forces must be accomplished with diplomacy and without unnecessarily intruding his own personality; else they will conclude he is assuming the authority of his superiors.

As a lawyer and an entertainer, he must be familiar with laws affecting the operation of trains on his division and his office door must always be open to admit the visiting officer, employee or shipper; listen and reply to their grievances and entertain them in a manner satisfactory to them and the company.

As a teacher and orator, the employees of the transportation department must be brought together in classes at regular intervals; the book of rules rehearsed, and the men given an



opportunity to express their opinions freely. In these discussions the trainmaster must see that no employee expressing an opinion is embarrassed by remarks of others. In explaining a rule, it must be done in an entertaining manner, void of all ridicule and sarcasm, for here is where the younger employee is receiving his education and will begin his development, taking pattern after your address.

In these classes for instruction and exchange of ideas is where harmony among those in the rank and file must be promoted; when brought into closer contact with the technical operations of the railway they become more familiar with the duties and responsibilities of each other's positions and their differences are easily adjusted.

No trainmaster can afford to neglect nor delegate to others, this, his paramount duty and obligation to the men. It is his one grand opportunity to meet with them, encourage them in their work, promote harmony and elevate their position, socially as well as mentally.

The terminals should not be neglected in this work of education and advancement as it is in the terminals the seeds of dissension are sown most thickly.

The terminal proposition of to-day is an all absorbing topic among transportation officials, and a "first class trainmaster" must be a man who can handle it. Road movements are easy when compared with terminal management. If your terminals are well organized with well selected men at the head, trains will leave on time, and a consequent road efficiency result; therefore, guard well your terminals; select carefully the men to operate them and by monthly comparisons of performance sheets, keep them on their mettle.

After these different subjects have been mastered and everything is working in harmony; and the trainmaster has seen the over-time reduced from alarming proportions to one-tenth of 1 per cent. of the total freight train rolls, and his passenger train movement assumes a 97 per cent. efficiency, he can begin to feel that the student hours have been well spent and can afford to branch out into higher researches. Results of his stewardship are to be analyzed, cost in obtaining the above results must be reckoned with, organizations must be strengthened, road supervision tightened. Why? Because you will find that when train movement is at its best, we are in the most danger of accidents; the men, over-confident, easily drift into careless practices. Then, and at such times are the opportunities for opening these schools of instruction and talking with the men, pointing out the dangers and promoting the feeling of good fellowship which should exist between the trainmaster and the subordinates; but such feeling should not be carried to a point of familiarity.

My advice to the young man accepting the position of trainmaster is to hold fast to the third qualification—

#### BE AN HONORABLE MAN.

Exemplify the precepts of the Golden Rule and men will cling to you and be inspired to loyal and faithful service. Do not overburden them with petty rules and conditions; study their position, making their troubles your own, and relieve them of as many as you can. Write as few letters to them as possible, and then never put irritating language into a letter, as they will read it too often, and the sore spot will become more acute at each reading. Better call them into the office and say to them personally the unpleasant things when such are necessary. Uphold the conductor's authority. Do not deprive him of his dignity by reprimanding his brakeman in the presence of the conductor. He is responsible to you for the men on the train and should be made to feel this responsibility.

In making rules and issuing instructions, give them careful thought beforehand. If a rule is an old one and is being violated, attention should be called to it, but do not reissue the old rule. If, after attention is called to the infraction

the violations continue, do not criticize in a general letter to "All Concerned," but locate the guilty offender and apply discipline as the case may warrant. The other men will appreciate the fact of your having observed their compliance with your instructions. Do not be the first one to break your own rules and instructions; it will only be license for others to do so.

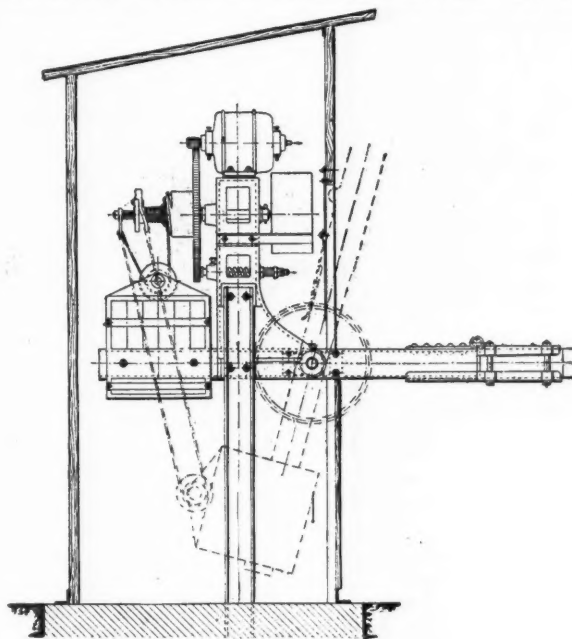
In imposing discipline, study well each case; better that a dozen guilty ones escape punishment than impose discipline upon one innocent employee. Remember the trainmaster has a responsibility not only for the disposition and happiness of the employees themselves, but for their families as well, and bear in mind that the discipline you impose, if not just, will react upon the company from the home of the employee, where the children will hear of your injustice to the father, and the young mind will grow up from that household to enter the service with the seeds of insubordination already sown; all in consequence of your hasty actions.

Do not condemn your men too freely to your superior, for it is through you the superintendent must see and know them; you are to be their support and defense. Without this support they are like a cork drifting, and the tide will carry them into vicious company. Weed out objectionable characters early, but be sure you do not up-root some valuable material in doing so. Above all, avoid favoritism, for in the pit of favor innumerable trainmasters have fallen.

In conclusion let me again say, as I did in the beginning, that a trainmaster loyal to his calling, to his superintendent and to his company, has no time to think of himself or of his future; he is lost in his profession and must trust such things to his superiors. If his ability has not found him out and he is forgotten, he can still say he has been one of the happiest and busiest of his superintendent's staff.

#### AN AUTOMATIC CROSSING GATE.

On the Montreux-Berne-Oberland electric railway, near Montreux, Switzerland, there is an automatic grade-crossing gate. When a car approaches the crossing the electrical apparatus lowers the barriers across the roadway, and when the car



Electric Motor for Closing Crossing Gate.

has passed they are automatically lifted. The barrier is a long pole. An iron column carries on a cast-iron bracket all the driving mechanism, including the motor, resistance coils and rheostat. The motor drives a large gearwheel on a horizontal axis fitted to a conical drum with a spiral groove for

winding the cable. The end of the shaft serves as the suspension point for one end of the cable which passes around a pulley on the short end of the crossing bar or gate. Below and parallel to the axis of the drum is a spring brake. The barrier is a channel iron with a light wooden extension. Its short end carries a counterweight of cast-iron. At the spindle supporting the bar is a drum on which is wound a cable which crosses the track (overhead) on a set of pulleys and operates the swinging bar on the other side of the track. To protect the driving mechanism from the weather it is covered by a light housing which can be readily removed.

Incandescent lamps and an electric bell are used as signals for wayfarers, thus giving both visible and audible indications. The current for the bell, lights, and motor is supplied through the contact of the bow trolley with an auxiliary wire paralleling the trolley wire. The proper length of this signal wire depends upon the usual speed of the train at the crossing

winds upon the conical part of the drum, and the mechanical resistance thus retards the motor, and the bar is brought gradually to rest. While the bar remains closed the current continues to traverse the motor and is not interrupted until the bow trolley leaves the auxiliary wire. Then the counterweight acts to bring the bar to the vertical position.

#### RECORD DISCIPLINE ON THE UNION AND SOUTHERN PACIFIC.

Brown's discipline—the recording of demerits, measured by "days," instead of suspending employees for misconduct and negligence, has been in use on the Harriman Lines for about 10 years, and Mr. Kruttschnitt, the director of maintenance and operation, has recently had elaborate comparisons made of the working of the system in the different parts of his territory—the Union Pacific, the Oregon Short Line, the



Automatic Electric Crossing Gate at Montreux, on Lake Lemman, Switzerland.

and is so adjusted as to allow the apparatus to operate shortly in advance of the passage of the car.

When the bow trolley of the locomotive or car comes in contact with the auxiliary wire closely paralleling the main trolley wire the auxiliary wire is connected to the line. The resulting current operates the motor, the incandescent lamps and the electric alarm bell. The motor is series wound and takes about one-tenth horsepower, running on 120 volts at 400 revolutions a minute. In order to avoid the effect of variations in voltage in the line upon the motor speed a shunt resistance is paralleled with the armature winding to diminish the influence of voltage fluctuation upon the motor. The lamps are placed at each side of the crossing and serve at the same time as lights and signals. The electric bell is connected in the lamp circuit paralleling a resistance.

The operation of the bar requires about 20 seconds. Before it has completely reached the horizontal position the cable

Oregon Railroad & Navigation Co. and the grand divisions of the Southern Pacific.

A summary of the most recent statement, that for the last calendar year, is given in the table printed herewith. The two halves of the year are entered separately. The figures giving numbers of employees disciplined include reprimands, suspensions and discharges. The averages of the suspensions, it will be seen, include the reprimands though they do not include discharges. As a reprimand does not appear in the columns showing the number of "days," it is to be borne in mind that the average is thus abnormally reduced.

It will be seen that, with an average number of about 28,000 employees, the amount of wages saved to these men by the abolition of the former custom of "laying off" a man for 30 days, more or less, has been, for the year, almost \$400,000; or, to be exact, \$391,793.66. This is a fact of no little importance. The primary object in any effort to improve discipline is, of







as a result the superintendents are administering the system more in accord with its true purpose, and more effectively than in the past. No material change has been made in the Brown system on the Harriman Lines during the 10 years that it has been employed, except to start this inspection.

The officers of these roads are disposed to believe that the system would be made more effective if the records of discipline were placed open to the inspection of all employees, instead of each man's record being kept open only for his own inspection. This change would be in line with the Harriman Lines' system of giving publicity to the facts about accidents.

#### RECORDS OF GREAT WESTERN CAB SIGNAL.

The audible cab signal which is used on the locomotives of the Fairford branch of the Great Western Railway has now been in service two years and a half, and Mr. Blackall, signal engineer of the road, has sent us the record, printed below, which shows the behavior of the signals for the 12 months of the last calendar year. The Fairford branch is beyond Oxford, and about 75 miles from London.\* Mr. Blackall writes that very little trouble has been experienced with frost and none with snow, the contact shoes on the engines being heated in cold weather by steam. These signals are used in place of the fixed visual distant signals, and the distant semaphores have been taken out of service. There are on the Fairford line an average of 5,650 signal operations a year. A record is kept of every irregularity. These, during the 12 months ending December last, were as follows:

1908.	Bell instead of whistle.	Neither bell nor whistle.	Both bell and whistle.	Whistle instead of neutral.	Whistle independently of ramps.
January .....	..	..	..	4	1
February .....	..	1	1	3	..
March .....	..	..	..	3	..
April .....	..	1	2	1	..
May .....	..	..	1	3	..
June .....	..	..	..	3	..
July .....	..	..	..	..	..
August .....	..	..	..	2	..
September .....	..	..	..	3	..
October .....	..	..	..	..	..
November .....	..	..	..	1	..
December .....	..	..	..	3	..

It will be observed that during the whole 12 months there was not a single case of a false "clear" signal; in fact, there has not at any time been such a case, either on the Fairford line or on the main line.

The causes of the failures have been various. The two cases in which neither bell nor whistle was received were bell failures; that is to say, the line was clear and the operation of the danger signal was duly and properly suppressed, but the bell failed. Two failures were caused by something on the engine getting in contact with the shoe and so short-circuiting the electro-magnet connected with the shoe; two or three cases were due to frost. There was one case of a broken wire and another due to a defective battery.

On the main line between Reading and Slough 76 signaling ramps have been installed. Eleven engines are fitted with the cab apparatus and 10 more are being fitted. No record has been made of the number of signal operations on the main line, although a record is kept of all failures.

The design of the cab apparatus on the main line engines has been somewhat modified from that originally installed on the Fairford line. Instead of the current picked up directly energizing the electro-magnet for keeping the whistle closed, current from the line operates a polarized relay on the engine, which keeps the whistle closed by means of a local circuit. This modified type of apparatus is shown in the diagram given herewith.

It will be recalled that in this apparatus the locomotive shoe, on coming in contact with the "ramp" on the roadbed, opens an electric switch on the engine, which causes a whistle to blow, giving the caution signal, unless the metal top of

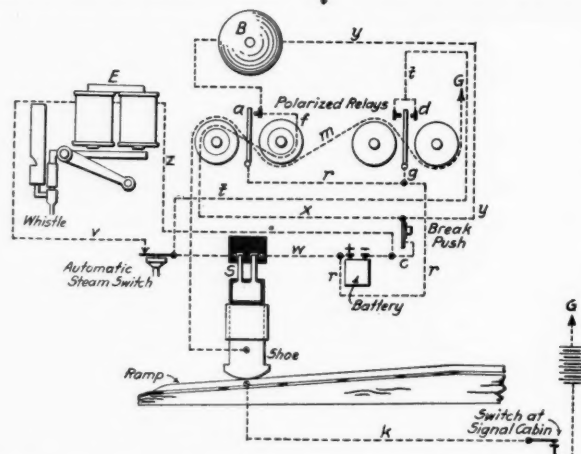
the ramp has been electrified from the signal cabin, in which case an electric circuit is completed on the engine, which suppresses the whistle and causes the ringing of a bell, indicating all-clear.

Assuming the engine to be running from one signal to another, the whistle is kept quiet by electro-magnet E which holds up its armature, being energized by the current from the battery through *w*, *S*, *v*, *z*.

On striking a ramp which is not electrified and which therefore should give a caution signal, the lifting of the shoe opens switch *S*, breaking the circuit just described, de-energizing the electro-magnet; and thus the whistle is caused to sound.

If the signalman has electrified the ramp by closing the switch in his cabin, the current through *k* and *m* energizes both polarized relays. The left-hand relay closes its points at *a*, and thus rings the bell (indicating all clear) by closing the circuit from the positive side of the battery through *r*, *a*, *B*, *y* and *c*.

At the same time the closing of the points *d* completes the circuit from the positive side of the battery through *r*, *g*, *d*,



Circuits for Audible Cab Signal. Great Western Railway.

*t*, *v* and *z*, which energizes electro-magnet E, and thus keeps the whistle from sounding.

When contact is made at *a* the polarized relay keeps itself energized (after the opening of the circuit through the ramp) by completing a circuit through its own coils from the positive side of the battery through *r*, *a*, *f*, *x* and *c*. Thus the bell is kept ringing by the circuit from the positive side of the battery through *r*, *a*, *B*, *y* and *c*.

The South African gold-mining country, whose center is Johannesburg, reaches the sea at five different ports. Of these Capetown is 957 miles distant, Port Elizabeth 714, East London 667, Durban 484, and Delagoa Bay 367. But the nearer ports are on the Indian ocean successively more distant from Europe for vessels going around the Cape. A further problem is the fact that Delagoa Bay is in a foreign country—Portuguese East Africa—and is a little further north than Johannesburg. The usual course of things, when the differences in distance are not too great, is for an approximately equal through ocean and rail rate by all ports. But in this matter Delagoa Bay has not only the shortest rail distance, but, so to speak, the whip hand. The Rand depends on natives for laborers, and the chief recruiting ground for native labor is Portuguese East Africa. "Treat us right," say its authorities, "and you may drum up niggers in our territory; otherwise, not." The result is that the rates on import goods per ton have been fixed as follows: Delagoa Bay, £2 13s. 4d.; Durban and East London, £3 3s. 4d.; Port Elizabeth, £3 8s. 4d.; Capetown, £4. Under these rates Delagoa Bay has had 58 per cent. of the imports; Durban, 29 per cent.; East London, 4¾; Port Elizabeth, 6¾, and Capetown, 1½.

\*This cab signal was described in the *Railroad Gazette* of November 15, 1907.

**WEIGHING COAL, AND LEGITIMATE SHRINKAGE.\***

As a matter of course, care must be taken to have reliable weights marked on freight cars, and where there is any doubt on that score the cars should be light weighed, and if necessary, re-marked en route for loading. All railway freight equipment should be light weighed and the tare weights remarked at least twice a year or oftener to insure correction of any errors developing therein. Errors in the marked tares may occur in several ways: The material in wooden freight equipment may shrink or absorb weight. The prevailing tendency is to shrink. Repairs, retimbering, exchange of trucks or other parts, are productive of changes in the light weights, and sometimes errors are made by weighing or re-stenciling employees.

It is urged that every member of this association bring to bear all of the influence possible to insure proper attention to the revision of the tare weights marked on railway freight equipment.

One of the large western roads expects soon to have installed on its equipment a device that will make it possible for the weighmaster to revise the tare weights while the cars are on the scale, without appreciable detention to the switching crew.

**LEGITIMATE SHRINKAGE ALLOWABLE ON CAR LOTS.**

Much may be said upon this subject; sufficient to state that on coal shipped from dry mines, the actual inherent shrinkage of weight in transit is nominal.

There is bound to be some loss of weight between point of shipment and final destination arising from evaporation of any moisture which the coal may contain or from unavoidable waste, imperceptible loss. All concerned should bend every effort toward the elimination, as far as practicable, of differences between point of origin and destination weights.

As a matter of course, coal from a wet mine will show a somewhat greater shrinkage in transit than that which comes from dry mines, provided the weighing at the mines is performed immediately after the loading is finished.

Washed coal is in a class by itself. If loaded while dripping wet and weighed immediately after the car finishes loading, the shrinkage will be immensely greater than in the case of washed coal that has been in the bins of the washery until drained, or that is not weighed until 10 or 12 hours after the loading is completed.

It would be wrong to pass over the subject of shrinkage without alluding to certain circumstances that have contributed largely to the prevailing confusion, to wit:

Defective scales.

Faulty weighing, either at point of shipment, in transit, or at destination.

Defects in marked tares.

Failure to properly inspect and prepare cars for loading so as to prevent avoidable leakage in transit.

Pilferage, before the cars leave the mines, in transit, or after the cars are delivered to consignee at point of unloading.

Waste between car and wagon scales or failure to empty the car clean where wagon scale weights at destination are matched against mine or in transit track scale weights.

Weather effect, rain, snow, sleet, etc.

**CONSIGNEES' WAGON SCALE WEIGHTS.**

This paper has already dealt with the initial weighing at mines or primary weighing stations. The consignee, too often, is misled by errors in weighing, defective scales or confusion of his own weights. His weighing is usually done upon wagon scales located at some distance from the car's side. Owners of wagon scales very often neglect them, primarily because of the trouble and expense in securing regular inspection and the services of a competent scale expert. Such scales are usually exposed to the weather, and if neglected the depreciation

is rapid. Very few of them are equipped with type registering beams, and to add to the likelihood of error or confusion, many coal dealers shape their loads and weighings to correspond with the orders on hand, adding to, or reducing, the weight of each load as taken from the car while the wagon is on the scale, thus making a continuous haul from the car to the customer; instances are of record where an occasional wagon load has inadvertently reached the customer without being sent to the wagon scale; now and then the coal is first unloaded from car to bin, and is thence taken to the wagon scale. The consignee frequently occupies from two to four days in unloading a car. No protection being provided by him for the property during the night. The tare weight of the wagon is usually a doubtful factor; also the location of the driver, whether on or off the wagon when weighed light or loaded.

It requires no stretch of the imagination to determine that large differences between origin and destination weights are likely to arise under the circumstances just recited.

**INSPECTION AND PREPARATION OF CARS FOR LOADING.**

Coal operators can almost entirely eliminate the waste of coal account leakage by systematic inspection of all cars just before loading to see that all of the drops of hopper, drop-side or drop-bottom cars are amply secured and that no cracks or crevices admitting of leakage are left unprotected.

**PILFERAGE AT MINES, IN TRANSIT OR AT DESTINATION.**

Pilferage is a broad and much discussed feature of the service. If neglected, it will flourish; its abatement can be secured by proper activity on the part of all concerned; namely, operator, carrier and consignee. Protection should begin with the coal operator immediately after the loading is finished and should not end until the coal is safely stowed in consignee's bins. At some of the mines the employees feel at liberty to supply their domestic needs from the most convenient cars. In this connection the following extract from one of the committee's correspondents is quoted:

"Some of the coal stands in the yards 15 to 20 days before it is billed, especially when there is no ready sale for it. Very few of the coal miners ever think of buying coal; they take it from the cars, often in the presence of mine operators, who never say a word to them about it. In talking to some of the operators in — district, they told me they could not afford to quarrel with the miners on account of the coal which they took from the cars, preferring to let them have the coal rather than quarrel with them about it, as most of the miners are foreigners."

It would seem that the carrier fulfils its duty when all train and station employees are placed under positive instructions by bulletin and otherwise to afford all possible protection to coal and other property transported in open cars while in the custody of the railway company. The influence of coal operators and coal dealers should be combined with that of the carriers toward more rigid enforcement of the laws respecting pilferage. Some time ago one of the carriers caused the arrest of coal thieves and lodged evidence proving guilt, but met with the refreshing judgment that in the opinion of the justice it was not a crime for poor people to steal coal from passing freight cars during extremely cold weather. Another of our correspondents writes:

"In some localities the justices refuse to fine parties for stealing coal from railway cars. Quite a number have told me that they have had persons arrested at different times and when brought into court they were dismissed."

The operators should urge their customers, the coal dealers, to co-operate by invoking the aid of the local authorities to secure proper punishment of the culprits.

The consignee should afford proper protection for the property during process of unloading and expedite the work as much as possible.

**WEATHER EFFECT, RAIN, SNOW, SLEET, ETC.**

There are many false impressions regarding the weather ef-

\*From a paper presented before the International Fuel Association by F. C. Magly, Chas. S. Keith and W. J. Jenkins, Committee.



fect (rain, snow, sleet, etc.) upon loaded freight cars. It is well to bear in mind that if a full inch of rain should fall upon and be retained by the exposed surface of a 36-ft. car, the weight would be increased less than 1,600 lbs. Drainage usually commences very soon after the rain begins and the evaporation is quite rapid. With few exceptions, the average precipitation is slight in the coal districts concerning which the committee has data.

#### TESTING TRACK SCALES.

The most suitable device for testing railway track scales is a testing car built entirely of iron and mounted upon four wheels with short wheel base, its sealed weight being determined by master scale. The car is reweighed in and out and resealed upon each recurring trip. Scale manufacturers, F. O. Becker, Superintendent of the Western Railway Weighing Association, and a number of the leading railways strongly favor the use of such cars. Their weight is sufficient to develop any slight inaccuracy in any part of the scales under test and they are especially advantageous because the scale inspector can move them on or off the scale without the aid of a switch engine. The efficiency of such cars is incomparably greater than the numerous 50-lb. test weights which would have to be used to obtain a like test.

#### THE NEW PENNSYLVANIA STATION IN NEW YORK.

The last piece of stone has been set in the exterior of the new station in New York City of the Pennsylvania Railroad, and the company has sent out photographs of the building, one of which we reproduce. This completes a masonry structure enclosing eight acres of ground. The exterior walls of the building aggregate 2,458 ft. in length, and the job has taken 490,000 cu. ft. of pink granite. In addition, there has been utilized inside the concourse 60,000 cu. ft. of stone, a total of 550,000 cu. ft., or 47,000 tons, all brought from Milford, Mass., in 1,140 freight cars.

There has been used in this building 27,000 tons of steel and 15,000,000 bricks. The first stone of the masonry was laid June 15, 1908. Illustrations of plaster models of this building were given in the *Railroad Gazette* of Sept. 23, 1904; of plans Feb. 9, 1906, and of architect's interior and exterior perspectives May 25, 1906. The building covers the entire area

bounded by Seventh and Eighth avenues and 31st and 33d streets. The length of the building is 788 ft. 9 in., and the width 430 ft. 6 in. McKim, Mead & White, the architects, aimed to design an exterior which would be recognized as a railway station, and also to give to the building the character of a monumental gateway. The structure is really a monumental bridge over the tracks, with entrances to the streets on its main axes and on all four sides.

The Roman Doric colonnade seen in the view is double at the carriage entrances at the corners and at the main front entrance for pedestrians in the center. Each of the columns is 4 ft. 6 in. in diameter and 35 ft. high. Above the central colonnade is an entablature surmounted by a clock with a dial 7 ft. in diameter. The center of this clock is on the axial line of 32d street, and 61 ft. above the sidewalk.

Midway along the sides of the building, signaling the entrances on 31st and 33d streets, are series of columns of the same dimensions as those on the Seventh and Eighth avenue facades, for a distance of 117 ft. The Eighth avenue frontage is treated on the plan of pilasters except for 44 ft. 6 in. in the center, where is another spacious entrance to the main floor of the concourse.

#### FOREIGN RAILWAY NOTES.

A consular report says that work on the extension of the Central Railway of Venezuela is being pushed rapidly. The line runs from Caracas to Santa Lucia and is being extended southeast to Ocumaro. Rails and locomotives bought in Europe were recently delivered.

A bill has been introduced by the Russian Ministry of Ways and Communications to ratify the plan for building the western section of the Amur Railway from Ourume to Kerok, with a branch to Amur. The line is to be 412 miles long and the cost is estimated at over \$40,000,000.

The total length of the railway under construction or likely to be built during 1909-1910 in British India is 3,222 miles. Of this 1,196 miles are to be built by the government and 2,026 miles by private companies. The total proposed expenditure in 1909-1910 is about £2,436,500 (\$12,182,500).



New Pennsylvania Passenger Station at Seventh Avenue, Thirty-first and Thirty-third Streets.

Looking west toward main entrance.



## General News Section.

According to a Chicago newspaper 51 persons have been killed by automobiles within the limits of that city during the first seven months of this year; and 1,018 were injured.

At Jackson Hill, near Richmond, Ind., engineers of the Pennsylvania Company are setting up refrigerating apparatus to freeze quicksand, which has interfered with their work in connection with grade revision.

Floods near Monterey, Mexico, on August 11, caused by heavy rains and the overflow of the Santa Catarina river, inundated the tracks of the National Railway lines, washed away a few bridges and compelled a suspension of traffic.

The Santa Fe has put a McKeen motor car on its line between Emporia, Kan., and Topeka. The car is 70 ft. long, weighs 60,000 lbs. and is 200 h.p. It will make one trip daily each way between Emporia and Topeka, covering the distance of 64 miles in 2 hours and 10 minutes. The service of the car for 30 days will be experimental.

At Montreal this week three men were arrested for conspiracy to defraud by presenting false claims for damages for personal injury in railway accidents. The legal department of the Canadian Pacific is quoted as authority for the statement that an extensive conspiracy has been discovered—an organization having branches in Toronto, Chicago, Vancouver and other places.

Benjamin M. Snyder, Jr., of Elmira, N. Y., and Wallace Brockman Porter, of Youngstown, Ohio, are the successful candidates for the Frank Thomson scholarships this year. With the addition of these two young men there will be six holders of these scholarships, which amount to \$600 annually, and which are awarded upon a competitive examination to sons of employees of the Pennsylvania Railroad system.

The strike of freight handlers at Fort William, Ont., last week was accompanied by a good deal of lawlessness, and on August 12 troops were sent from Winnipeg to preserve order. The strikers or their sympathizers had fired on and wounded a number of constables. The striking laborers are largely Greeks, Hungarians and Italians, and the number who went on strike was about 1,000. On Tuesday of this week the troops were sent home.

A movement has been started by the Oklahoma Federation of Commercial Clubs for the repeal of certain of the restrictions imposed upon railways by the state constitution. The constitution, among other things, prohibits any railway operating in the state from connecting with other lines outside of the state which have not Oklahoma charters. It is claimed that this restriction, with others, is seriously retarding railway development in Oklahoma.

Six express trains made up of cars having doors in the sides are now in use in the New York subway. The side doors are midway between the two ends of the car, and both the end doors and the side doors are used indiscriminately for both exit and entrance; but in the non-rush hours all passengers go out and in by the doors at the ends of the cars, a notice for passengers' guidance being posted in the center of the car. The end doors are operated manually and the side doors by compressed air. The eight cars which have side doors near the ends and which were tried for a few trips several months ago, are to be converted into the center-door type.

To reduce fires in the Arkansas national forest the Government Forest Service has entered into an agreement with the Kansas City Southern Railroad. The railway is to clear its right-of-way of all inflammable material for 50 ft. on each side of the track and burn over an additional 100 ft. wherever necessary. The maintenance of a forest service telephone line along the right-of-way will also be allowed. The Forest Service will patrol and supervise the clearing of the right-of-way, supply tools and maintain and operate sufficient tele-

phones as well as grant the railway the timber free of charge where it is necessary to clear the right-of-way. The agreement is for 10 years. The Forest Service will be glad to have similar co-operation with other railways traversing national forests.

According to a press despatch from Washington, the government has asked James J. Hill, chairman of the Great Northern Railway, to assist in entertaining the company of business men from Japan which is coming to visit this country. A despatch from Seattle, however, says that the Great Northern and the Northern Pacific have agreed with the Associated Chambers of Commerce of the Pacific Coast to run special trains for the Japanese visitors free of charge; which has the appearance of illegal discrimination. The reporter should now take up the question whether Mr. Hill ought to ride in the observation car, in the rear of the train, with the distinguished visitors, or be put in irons and carried in the baggage car as a lawbreaker.

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### Coal Output in 1908.

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The total productions of coal in the United States, in 1908, as reported by E. W. Parker, of the United States Geological Survey, was 415,842,698 tons of 2,000 lbs., having a spot value of \$532,314,117. Of this total 74,347,102 long tons (equivalent to 83,268,754 short tons) with a spot value of \$158,178,849, was Pennsylvania anthracite, and 332,573,944 short tons, with a spot value of \$374,135,262, was bituminous and lignite.

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### Thirteen Passengers Killed in France.

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Press despatches of August 9 report a collision at Jumeau, France, killing 13 persons and injuring 22, some of them fatally. The collision was between a freight train and an inter-urban car and it is said that the motorman of the car neglected or failed to see the stop signal. The despatches would seem to indicate that this was a grade crossing collision of the regulation American pattern.

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### Bridges Dynamited.

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At Cincinnati, August 12, the new bridge of the Cincinnati Southern Railroad, in course of construction, was considerably damaged by an explosion of dynamite and windows were blown out of houses a considerable distance away. The contractors in charge of the work on the bridge have had trouble with their workmen.

Three days later a similar outrage was reported in the borough of the Bronx, New York City, where an explosion under a highway bridge of the New York, New Haven & Hartford shook houses for miles around. This bridge is one of a number which have lately been built in connection with the reconstruction of the railway of the Harlem River branch of the New Haven road. Here, also, the contractors are said to have had trouble with the labor unions and a bridge not far away was blown up two months ago.

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### The Uncertainties of the Corporation Tax.

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As the corporation tax now stands not only may the corporations cause no end of trouble by failing to make returns or failing to get them in proper form, or by making them inaccurate beyond the power of the bureau to rectify, but some of them will contest the law, and there is no knowing how much or how long its administration may be held up. Its constitutional validity, as well as its equity and its expediency, is seriously questioned, and it is sure to be put to a judicial test, the result of which will long be uncertain. In the meantime the economic authorities will be inquiring into it and perhaps bringing it into disrepute. There is to

be a conference on state and local taxation at Louisville, Ky., next month, and there are several topics on the programme bearing on this tax, which trenches on one of the chief sources of state revenue. There is likely to be a demand from the International Tax Association, which is to hold this conference, for the repeal of the tax at the very next session of congress and before the trouble goes too far. The situation illustrates the unwisdom of precipitating legislative action on a subject of this kind. Public opinion had not been tested upon it. It had not been subject to discussion, and it was evident that a majority in both houses of congress were averse to it. It was practically forced into effect by being loaded upon the tariff bill and carried to enactment by it. Now the trouble of getting it into practical operation is to begin, with a pretty fair prospect that it will be thrown out either by repeal or judicial excision.—*The Journal of Commerce*, New York.

#### Railway Business Association.

The manufacturers who have joined the Railway Business Association since April 20, 1909 (*Railroad Age Gazette*, April 23, p. 910), are as follows:

Ajax Manufacturing Co., Cleveland, Ohio.  
 Atlanta Car Wheel & Manufacturing Co., Atlanta, Ga.  
 Barnum Richardson Company, Lime Rock, Conn.  
 Blue Island Car & Equipment Co., Chicago.  
 Bosley, D. W., & Co., Chicago.  
 Brown Car Wheel Works, Buffalo, N. Y.  
 Bucyrus Company, South Milwaukee, Wis.  
 Champion Rivet Co., Cleveland, Ohio.  
 Chicago Car Heating Co., Chicago.  
 Chicago Varnish Co., Chicago.  
 Cleveland Copper Ferrule Co., Cleveland, Ohio.  
 Consolidated Car-Heating Co., Albany, N. Y.  
 Cyclops Steel Works, Titusville, Pa.  
 Dressel Railway Lamp Works, New York.  
*Electric Railway Journal*, New York.  
 Featherstone Foundry & Machine Co., Chicago.  
 Forsyth Brothers Co., Chicago.  
 General Railway Supply Co., Chicago.  
 Hale & Kilburn Manufacturing Co., North Philadelphia, Pa.  
 Heath & Milligan Manufacturing Co., Chicago.  
 Hewitt Manufacturing Co., Chicago.  
 Hines, Edward, Lumber Co., Chicago.  
 Iroquois Iron Co., Chicago.  
 Joyce-Watkins Co., Chicago.  
 Lidgerwood Manufacturing Co., New York.  
 Magnus Metal Co., New York.  
 McCord & Co., Chicago.  
 Missouri Malleable Iron Co., East St. Louis, Ill.  
 More-Jones Brass & Metal Co., St. Louis, Mo.  
 New York Car Wheel Co., Buffalo, N. Y.  
 Railway Steel-Spring Co., New York.  
 Rogers, Brown & Co., Chicago.  
 Ryerson, Joseph T., & Son., Chicago.  
 Scullin-Gallagher Iron & Steel Co., St. Louis, Mo.  
 Soper Lumber Co., Chicago.  
 Standard Car Wheel Co., Cleveland, Ohio.  
 Standard Forgings Co., Chicago.  
 Standard Paint Co., New York.  
 Taylor, W. P., Co., Buffalo, N. Y.  
 Tyler, W. S., Co., Cleveland, Ohio.  
 Union Draft Gear Co., Chicago.  
 United Supply & Manufacturing Co., Chicago.  
 Western Railway Equipment Co., St. Louis, Mo.  
 Whiting Foundry Equipment Co., Harvey, Ill.  
 Willard Sons & Bell Co., South Chicago, Ill.

#### Rewards to Union Pacific Agents for Rapid Loading of Cars.

In view of the extraordinary demand on the Union Pacific for equipment for the movement of grain during the fall months, this company will make awards as follows to agents having the best records for loading grain during the months of August, September and October: At stations where 250 or more cars of grain are loaded in the three months mentioned, \$75 will be awarded to the agent having the best record; at stations where 150 and less than 250 cars of grain are loaded, \$50; at stations where 75 and less than 150 cars are loaded, \$35; at stations where 25 and less than 75 cars are loaded, \$25; at stations where less than 25 cars are loaded, \$15. Superintendent Parks says:

"This plan is not intended to deny shippers any of the rights now enjoyed as to free time under the published demurrage rules, either for loading or unloading; on the contrary, it is felt that by well directed effort on the part of local agents our patrons will co-operate in this movement for quick relief by which a greater supply of cars will be available for waiting patrons, all shippers being mutually interested.

"Under this plan it is contemplated that agents will be on the alert and anticipate the grain loading requirements of their stations, both as to cars and grain doors.

"The records will be determined by taking into consideration: Time consumed in making empty and setting cars that are available for grain loading; prompt inspection of cars as to fitness for grain loading, having them clean and in serviceable condition, particular attention being given to roofs and doors; proper insertion of grain doors (reinforced side placed to the inside) to prevent bulging and also leakage through outside doors; prompt loading, proper sealing and billing; percentage of load to capacity of equipment, taking total number of cars loaded with grain; percentage of cars arriving at destination without any leakage. (Cars damaged in transit causing leakage will be eliminated.)"

#### General Passenger and Ticket Agents.

The fifty-fourth annual convention of the American Association of General Passenger and Ticket Agents will be held at the Hotel Secor, Toledo, Ohio, September 14. The following are the principal items of business on the program:

Report from the Standing Committee on Association Ticket Paper; arrangement of printed matter on coupons of interline tickets; uniformity in prepaid ticket orders; improved style of dating stamp; ticketing special baggage cars for interline movements; report from Standing Joint Committee of the General Passenger and Ticket Agents and the Accounting Officers; report from Committee on Standard Ticket Contracts; reports from co-operating associations, accounting officers, general baggage agents and others; adoption of standard colors in the printing of interline tickets, and election of president, vice-president and secretary.

George A. Cullen, general passenger agent of the Delaware, Lackawanna & Western, will deliver the annual address.

A meeting of the Fraternal Society will follow the business sessions.

#### Society of Railway Financial Officers.

This organization will hold its third annual meeting on September 7 and 8 at Hotel Champlain, Clinton county, N. Y., on Lake Champlain. It was originally intended to hold the meeting at Fort William Henry Hotel, Lake George, but on account of the destruction of that hotel by fire the place of meeting was changed.

During the past year the committee on "Forms of Vouchers and Agents' Drafts" has given much attention to the question of a uniform form of voucher draft. Several conferences have been held with special committees appointed for the purpose by the American Bankers Association, the Association of American Railway Accounting Officers and the National Association of Public Accountants, and a form of voucher draft has been adopted that is satisfactory to the several committees. The final report of the society's committee will be presented at the annual meeting for consideration at the hands of the members.

It is of considerable importance that a uniform form of voucher draft be arrived at from the standpoint of all interests concerned. Not only the railways but the numerous industrial corporations now using voucher drafts for their payments will be greatly interested in the movement toward a uniform blank, although it is conceded that banks will derive the greatest benefit from this desired uniformity. Many railways and industrial corporations have already adopted the suggested form in advance of its approval by this society.

At the coming meeting the method of paying employees will be discussed. This, however, may resolve itself into the recommendation of two separate systems, one for the payment of employees by drafts and the other in currency, as the loca-



tion of different railways, some in thickly settled and others in sparsely populated sections of the country, renders the adoption of either one of two elective systems advisable.

During the three years since the formation of the society it has increased materially in membership and it is proving a useful organization in the railway field. As now constituted it is governed by an Executive Committee of nine members. The members whose terms expire at the 1909 meeting are:

H. C. Ansley, Treasurer, Southern Railway.  
C. A. Clark, Treasurer, Northern Pacific.  
E. L. Copeland, Secy. and Treas., A., T. & S. F.  
F. H. Hamilton, Secy. and Treas., St. L. & S. F.  
E. L. Rossiter, Treasurer, N. Y. C. & H. R.

Members whose terms expire at the 1910 meeting are:

Geo. H. Crosby, Secy. and Treas., C., R. I. & P.  
T. H. B. McKnight, Treasurer, Pennsylvania Lines West.  
Frank Scott, Treasurer, Grand Trunk.  
J. F. Titus, Asst. to President, Illinois Central.

At the coming annual meeting several speakers of prominence in the financial world will address the society.

#### American Boiler Manufacturers' Association.

The twenty-first annual convention of the American Boiler Manufacturers' Association of the United States and Canada was held in Detroit, Mich., August 10, 11 and 12, with headquarters at the Hotel Pontchartrain. Some 200 members and guests were present. Two sessions of the association were held each day, the remainder of the time being enjoyed in pleasure trips on the Detroit river and Lake St. Clair.

The business meetings of the association were conducted by the organization's president, Col. E. D. Meier, president of the Heine Safety Boiler Co., St. Louis, Mo., assisted by the secretary, J. D. Farasey, of the H. E. Teachout Boiler Works, Cleveland, Ohio. The committee report on Uniform Specifications was thoroughly discussed and a copy ordered sent to the American Society for Testing Materials. The new Massachusetts state law governing boiler material and construction was favorably commented on.

The association voted to hold its annual convention next year in Chicago late in September or early in October. Officers for the ensuing year were chosen as follows:

President, Col. E. D. Meier, Heine Safety Boiler Co., St. Louis, Mo., and New York.

Secretary, J. D. Farasey, H. E. Teachout Boiler Works, Cleveland, Ohio.

Treasurer, Joseph F. Wangler, Joseph F. Wangler Boiler Co., St. Louis, Mo.

First Vice-President, T. M. Rees, James Rees & Sons, Pittsburgh, Pa.  
Second Vice-President, J. Don Smith, Charleston Iron Works, Charleston, S. C.

Third Vice-President, W. A. Brunner, Tippet & Wood, Phillipsburg, N. J.

Fourth Vice-President, H. D. MacKinnon, MacKinnon Boiler & Machine Co., Pay City, Mich.

Fifth Vice-President, M. A. Ryan, Duluth, Minn.

The Supply Men of the American Boiler Manufacturers' Association held their annual convention at the same time. The supply men are entitled to associate memberships in the association and allowed to participate in the discussions of the convention, but they are not allowed to vote. They elected officers for the coming year as follows: President, W. O. Dunkley, Chicago; vice-president, J. T. Corbett, Chicago; treasurer, H. B. Hare, Cleveland, Ohio; secretary, W. H. S. Bateman, Philadelphia, Pa. A number of the supply interests represented at the convention were as follows:

Ashton Valve Co., Boston, Mass.  
Carnegie Steel Co., Pittsburgh, Pa.  
Central Iron & Steel Co., New York.  
Chambersburg Engineering Co., Chambersburg, Pa.  
Champion Rivet Co., Cleveland, Ohio.  
Chicago Pneumatic Tool Co., Chicago.  
Cleveland Punch & Shear Works Co., Cleveland, Ohio.  
Detroit Seamless Steel Tubes Co., Detroit, Mich.  
Hilles & Jones Co., Wilmington, Del.  
National Tube Co., Pittsburgh, Pa.  
Niles-Bement-Pond Co., New York.  
Otis Steel Co., Cleveland, Ohio.  
Parkesburg Iron Co., Parkesburg, Pa.  
Joseph T. Ryerson & Son, Chicago.  
Scully Steel & Iron Co., Chicago.  
Tyler Tube & Pipe Co., Washington, Pa.  
Worth Brothers Co., Coatesville, Pa.

#### Chicago Railway Club.

The Chicago Railway Club has leased the third and fourth floors of the building at 112 Monroe street, Chicago, which were formerly occupied by the Iroquois Club. The rooms are being newly decorated and furnished throughout. The rooms on the third floor will be used for dining, lounging and reception rooms, and on the fourth floor for reading, library, card and billiard rooms. The rooms on each floor can be thrown together by movable partitions, giving a large seating capacity.

#### Southern & Southwestern Railway Club.

The August meeting was held at the Mechanical and Manufacturer's Club, Candler building, Atlanta, Ga., on August 19. Dr. T. A. Hancock, for 18 years surgeon of the Southern Railway, lectured on First Aid to the Injured. This meeting was the regular barbecue meeting, the barbecue being held in the afternoon.

#### MEETINGS AND CONVENTIONS.

*The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.*

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.  
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.  
AMERICAN ASSOC. OF LOCAL FREIGHT AGENTS' ASS'NS.—G. W. Dennison, Penna. Co., Toledo, Ohio.  
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.—R. W. Pope, 33 West 39th St., New York; second Friday in month; New York.  
AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York.  
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—S. F. Patterson, B. & M. Concord, N. H.; Oct. 19, 1909; Jacksonville, Fla.  
AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASSOC.—E. H. Fritch, Monadnock Bldg., Chicago.  
AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—R. E. Wilson, Ry. Exchange, Chicago.  
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago.  
AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia.  
AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; New York.  
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., N.Y.; 2d Tues. in month; annual, Dec. 7-10; New York.  
AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.—B. V. Swenson, 29 W. 39th St., New York; Oct. 18-22; Denver, Colo.  
ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago.  
ASSOCIATION OF RAILWAY CLAIM AGENTS.—E. H. Hemus, A., T. & S. F., Topeka, Kan.  
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Wisconsin Central Ry., Chicago.  
ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Place, New York.  
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.  
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, Montreal, Que.; irregular, usually weekly; Montreal.  
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.  
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R. R., Richmond, Va.  
INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.  
INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago.  
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—E. C. Cook, Royal Insurance Bldg., Chicago.  
IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month; except July and August; Des Moines.  
MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago.  
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.  
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.  
NORTH-WEST RAILWAY CLUB.—T. W. Flannagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.  
RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month; except June, July and August; Pittsburgh.  
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.  
RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.  
ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Sept. 14-17; Washington.  
ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.  
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Norquist, Chicago; Sept. 7-8; Hotel Champlain, N. Y.  
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. H. O'Donnell, Bogalusa, La.  
SOUTHERN AND SOUTHWESTERN RY. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., April, Aug. and Nov.; Atlanta.  
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R. R.R., East Buffalo, N. Y.; September, 1909; Denver.  
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, 199 Chestnut St.; Winnipeg; 2d Mon., ex. June, July and Aug.; Winnipeg.  
WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony Bldg., Chicago; 3d Tuesday each month, except June, July and August; Chicago.  
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; 1st Wednesday, except July and August; Chicago.



## Traffic News.

The Chicago & Alton, the Chicago, Rock Island & Pacific and the Missouri Pacific have announced that they will make first class rates of 2 cents a mile for parties of 10 or more traveling on a single ticket locally in Missouri and interstate between Illinois and Missouri.

The presidents of the railways entering Chicago at a conference on August 12 referred to the chairmen of the Central Freight Association and the Western Trunk Line Committee the matter of suggesting some method of discontinuing switching, tunnel and lighterage allowances.

The executive committee of the Western Passenger Association has refused a request by the Parmelee Transfer Company of Chicago to be allowed to check baggage from homes upon telephonic request. The committee's reason was that in such cases there would be no assurance that excess baggage was properly paid for.

The statistics of the immigrant bureau of the Western Passenger Association show that during the first six months of 1909 the number of immigrants arriving from Europe was 445,373, as compared with 133,410 during the same period of last year, an increase of 241 per cent. Of the arrivals 430,655 were aliens and 14,718 citizens.

The Lake Erie & Western has made a rate on all its lines in Indiana and Ohio equal to the rate now charged by the competing traction lines. The company will run five trains daily into Indianapolis from points as far north as Peru and as far east as Portland. The number of these trains will be increased during state fair week, beginning September 6. Officers say that short trains will be run and many accommodation stops made.

The railways between New York and Buffalo which have been making very fast time with westbound merchandise freight trains, have decided to cease their strife and the trains are now said to be running at ordinary speeds. According to the reporters the Erie was the first line to quicken its time; the Lehigh Valley and the New York Central followed, and then the Lackawanna, with the shortest line between the two cities, beat them all several hours.

It is reported from San Francisco that traffic officers of the Southern Pacific and the Atchison, Topeka & Santa Fe, after long conferences, have decided to oppose the application of Pacific coast terminal rates as the maximum rates to inland points. George W. Luce, general freight agent of the Southern Pacific, is quoted as saying that the present policy of requiring intermediate points to pay the rates to the coast plus the local rates back is regarded by the Southern Pacific and the Santa Fe as fair and reasonable and that they will defend it.

The railways in Nebraska have asked the state railway commission to postpone from August 24 to December 1 the hearings it has ordered on the reasonableness of class freight rates. The reason given is that the hearing would conflict with the taking of evidence in the federal court in the suits brought by the carriers to test the constitutionality of the state 2-cent passenger and commodity freight rate laws. The commission has indicated that it will comply with the request of the roads if they will agree to file with it every week a transcript of the evidence and copies of the exhibits introduced in the trial of the cases in federal court, the evidence and exhibits to be considered and received as a part of the evidence in the commission's hearings on class rates.

In a circular which has been sent out by John Sebastian, passenger traffic manager, and H. Gower, freight traffic manager of the Rock Island, about the corn show at Omaha on December 6-18, the representatives of both the freight and passenger traffic departments are told: "The work accomplished by the National Corn Exposition last year has been very far-reaching in its effect, and we feel that every effort should be made to encourage those who are devoting their time and energies to this matter. \* \* \* It will be your duty in connection with your regular solicitation to get in touch with

representatives of the exposition in your territory and to work with them as closely as possible. Please see that our desires are thoroughly understood by all those under your jurisdiction, and that no effort is spared to present the advantages of the exposition to the people in our territory."

For the Hudson-Fulton celebration in New York and vicinity passenger rates will be made to New York of one and one-half first-class limited fare, with minimum of \$1.50 for the round-trip. Tickets will be sold Sept. 24 to 30 and Oct. 1 from points within 300 miles of New York City, and on Oct. 2 from points within 100 miles; all outside the 100-mile limit good to return until Oct. 10. To Newburgh the rate will be one fare, for the round-trip, from points between Utica and New York City, Sept. 30, Oct. 1 and 2. To Albany and Troy the rate will be one fare for the round-trip from points in New York State, \$8.15 from Buffalo and Suspension Bridge, \$6.10 from Rochester and \$4 from Syracuse, and proportionate fares from other points west of Syracuse. Tickets will be good going Oct. 7, 8 and 9. Similar rates will be made to Poughkeepsie, Kingston, Catskill, Hudson, Cohoes and other upper Hudson river points.

The farmers of southern New Jersey in July surpassed all former records, shipping \$1,500,000 worth of fruit and vegetables to New England, the Middle West and Canada over the West Jersey & Seashore. In July, 1907, the value of the produce thus shipped from the six lower counties of New Jersey was \$746,800; in 1908 it was \$1,178,000, and this year it was \$1,563,600. The July record shows 2,322 cars of potatoes, 1,047 cars of tomatoes, five cars of apples, 148 of berries, 165 of clams and oysters, 148 of fish, 19 of peppers and 46 of poultry. The Pennsylvania Railroad during the last three years has been conducting a development campaign in behalf of the agricultural and commercial interests of New Jersey, sending all over the country lists of reliable growers and shippers in that section, and the result has been that the market for southern New Jersey produce has been greatly widened. The July shipments were distributed as follows: One thousand two hundred cars to Jersey City and New York, 628 to Camden and Philadelphia, 418 to Boston, 258 to other points in Massachusetts, 257 to Newark, 263 to Pittsburgh, other points in Pennsylvania 144, other New Jersey points 55, New York points 216, Ohio 80, Chicago 17, Maryland points 2, Connecticut 150, Vermont 9, New Hampshire 57, Maine 27, Rhode Island 86, Toronto 19, Montreal 15 and Michigan 8.

### The Schwartz Ticket Scalping Case.

The Railway Ticket Protective Bureau has issued a statement regarding the recent decision of Judge McSurely, of the state circuit court at Chicago, in a case involving the validity of the state law prohibiting railway ticket scalping. The Bureau says that Judge McSurely's decision does not in any way change the ticket scalping situation. It calls attention to the fact that his decision is not binding upon any other judge before whom a similar case may be brought and is contrary to the decision of the Supreme Court of the United States in the Bitterman case, in which it was held that ticket scalping is unlawful. The defendant in this case, a man named Schwartz, was arrested and indicted for selling a pass, and a motion was made by his attorneys to quash the indictment on the ground that the act under which it was returned was unconstitutional. The Bureau recalls that in 1894 the Supreme Court of Illinois in the Burdick case held the act constitutional by unanimous decision. Two years later certain ticket scalpers presented a petition to the Supreme Court, stating that the arrest and conviction of Burdick were collusive, the proceeding being based on an agreement between him and the railways that he should be convicted and that the case should be appealed to the Supreme Court, where a decision could be procured upholding the constitutionality of the law. The court refused to expunge its decision in the Burdick case, but said that the scalpers were not deprived by it of the right to present in lower courts the question of the validity of the law. Subsequently, several judges of the superior and circuit courts of Cook county, Illinois, held the state law unconstitutional, and it has since

been impossible to get a scalper convicted under the statute in Cook county, because in every case the indicted scalper has sued out a writ of habeas corpus before one of the judges who had held the law unconstitutional and thereby got his liberty. The Protective Bureau sought once more in the Schwartz case to secure a conviction, hoping that in that event the case would be appealed to the Supreme Court and the question of the constitutionality of the law could there be finally set at rest, but Judge McSurely ruled against the constitutionality of the law, and thereby the railways failed once more to get the question of the law's validity before the highest court of the state.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 53 giving a summary of car shortages and surpluses by groups from March 18, 1908, to August 4, 1909, says:

"The total surplus reported for the two weeks ended August 4 is 207,173, a decrease of 36,181 cars since our last bulletin.

Co-operation Between Farmer and Railway.

In an address delivered before the Farmers' Union of Oklahoma, B. F. Yoakum, chairman of the Executive Committee of the Rock Island Company, said in part:

The farmers and the railways are natural partners. The first thing inquired about by an investor in new railway securities is the character of the country which the road will serve. If it can be shown that the territory to be served is a good farming country, the greatest trouble in finding the money to build has been overcome. On the other hand, the first question a farmer seeking a location in a new country asks is, "What are its railway facilities?" The farmer must have the railway and the railway must have the farmer. Their interests are inseparably linked. The prosperity and success of one depends upon the prosperity and success of the other; moreover, the prosperity of all business is dependent on the farmer, for the farm is the basis of the nation's credit and wealth.

I do not come to tell you how you should run your farms, nor to discuss uplift theories of country life, but to exchange views and to promote intelligent co-operation. We can by working together accomplish more for our common good than

CAR SURPLUSES AND SHORTAGES, MARCH 18, 1908, TO AUGUST 4, 1909, INCLUSIVE.

	Number of roads.	Surpluses.					Shortages.				
		Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
August 4, 1909	169	103,646	6,985	61,486	35,056	207,173	334	243	986	63	169
July 21, 1909	165	116,221	9,971	78,675	38,487	243,354	106	169	31	33	339
June 23, 1909	166	121,441	12,099	89,292	40,112	262,944	211	190	193	233	827
May 26, 1909	158	118,077	14,940	97,006	43,687	273,710	83	99	1,011	47	1,240
April 28, 1909	161	107,665	16,487	110,538	47,638	282,328	144	106	74	173	497
March 31, 1909	158	101,344	20,428	128,546	46,282	296,600	158	98	116	27	399
February 17, 1909	159	98,512	23,924	135,208	43,797	301,441	266	97	11	96	470
January 20, 1909	162	127,204	26,723	116,680	41,057	311,664	163	21	139	35	358
December 23, 1908	158	87,350	16,247	79,595	38,885	222,077	471	42	289	217	1,019
November 25, 1908	160	45,194	12,157	43,854	31,624	132,829	7,923	178	900	209	9,210
October 28, 1908	158	39,383	10,185	31,541	29,803	110,912	8,175	167	2,261	236	10,839
September 30, 1908	160	42,593	10,365	49,795	31,039	133,792	7,313	450	224	127	8,114
August 19, 1908	160	106,367	13,494	92,500	40,642	253,003	465	90	105	194	854
July 22, 1908	166	120,580	14,401	125,739	47,960	308,680	115	37	330	27	509
June 24, 1908	163	123,112	18,042	130,149	41,995	313,298	266	34	120	31	451
May 27, 1908	160	144,697	20,075	162,695	54,437	381,904	82	13	12	18	125
April 29, 1908	159	147,971	24,350	186,742	59,542	413,605	145	42	16	64	267
March 18, 1908	160	103,509	25,122	119,205	49,206	297,042	533	151	250	73	1,007

Of this decrease 12,575 are box and 17,189 coal and gondola cars. This reduction, which is the largest since September, 1908, brings the surplus to a figure 74,448 cars below the corresponding period of last year, the decrease being chiefly in coal and gondola cars.

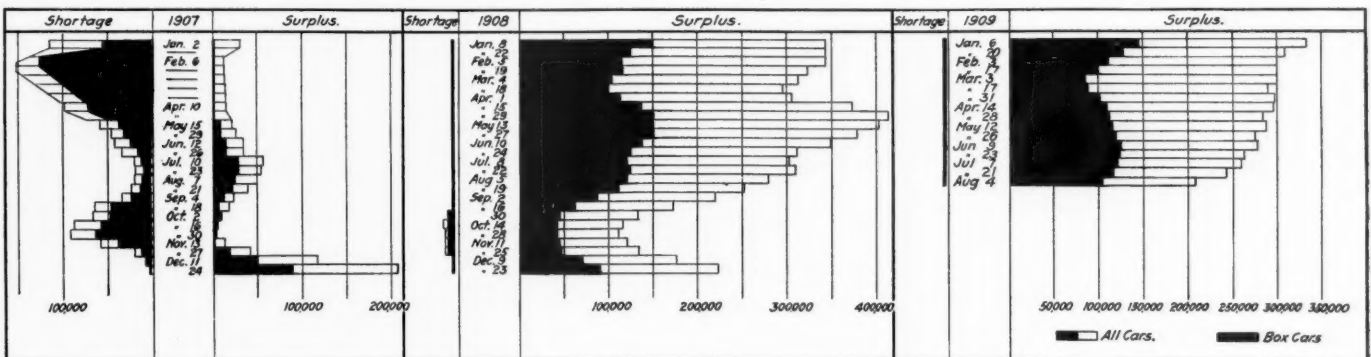
"The group totals show a general reduction in surplus throughout the country, with the exception of group 6 (North-western), where a considerable increase in box cars offsets the decrease in other classes. This increase is apparently due to the assembling of cars in anticipation of the grain movement. The percentage of reduction is greatest in groups 4

by working apart and relying upon the politicians to establish all governing conditions.

The things most needed by the farmer and the railway, but which are neglected to the detriment of both, are a better acquaintance and closer working relations.

These mutual benefits can be attained through the officers of the Farmers' Union, representing the producers, and the officers of the railways, representing the carriers, dealing directly with each other.

This country now needs what our forefathers used in laying its foundation—a lot of old-fashioned common sense. Good



Car Surpluses and Shortages in 1907, 1908 and 1909.

(North Atlantic) and 5 (Southern), where the surplus of July 21 is reduced more than half. If such reductions in car surplus continue we shall face a severe car shortage before October."

The accompanying table shows shortages and surpluses for the periods covered by the reports, and the chart shows shortages and surpluses in 1907, 1908 and 1909.

judgment and fair dealing are found more generally among the farmers than in any other occupation, and when they earnestly take hold of public questions they will occupy a place in our political structure that will make their good judgment and fair conclusions felt more and more in solving the relation of the government and its institutions.

As a matter of comparison, let us for a moment look at this



country's transportation as handled by the government and by the railways. The splendid railway system of the United States, superior, as it is, to any in the world, speaks for itself, but how about water transportation, for which the government is responsible?

Herbert Knox Smith, of the Department of Commerce and Labor, in a recent report says that this government has built about 4,500 miles of canals, and that more than half, costing over \$80,000,000, has been abandoned. This means \$80,000,000 of wasted money.

The United States government, 19 years ago, commenced the construction of the Illinois & Mississippi canal. Its length is 75 miles, and it has cost to date, with interest at 3 per cent., over \$9,000,000, or \$120,000 per mile. To maintain this canal in its present useless condition costs the country's taxpayers \$90,000 a year, exclusive of interest on the investment. A freight boat has never passed through it.

I mention this to illustrate one undertaking of the many which, through the lack of system or intelligent planning in advance of the construction of our inland waterways, make up the \$80,000,000 that are referred to by Commissioner Smith as wasted. The government has expended approximately \$225,000,000 on the improvement of the Mississippi river and its tributaries. The tonnage handled over the waters of the Mississippi last year was one-third less than it was 20 years ago. Professional politicians, in their public utterances, proclaim, in their efforts to prejudice the public against the railways, that grain, coal and other commodities can be handled from St. Louis and other Mississippi and Ohio river points to New Orleans for one dollar per ton, but they do not tell you that, figuring interest on the \$225,000,000 of tax money expended, each ton of last year's shipment by the Mississippi river and its tributaries cost the taxpayers 96 cents a ton in interest, in addition to the freight charges.

I have on several occasions urged the improvement of the Mississippi river and I am not now talking against it, but only illustrating the unbusinesslike and slipshod manner in which the government is carrying on its enterprises in handling the business of its stockholders, who are the taxpayers. I favor improvements of our waterways to aid in the development of the country, but I favor them only when systematically and properly planned and built in such a manner that they will perform the service for which the money is expended. Otherwise the expenditure will be waste, instead of investment.

Canal construction and operation are as simple as the construction and operation of railways, when properly located and operated in an economical manner.

Oklahoma needs no irrigation canals but is greatly interested in drainage, and the same governmental regulations apply to both.

The function of the government should be confined to the enforcement of such laws as will guarantee the public against injustice or discrimination, and the prosecution of all violators of such regulative laws. We should, as business men devoting our lives to special lines of work, find a way through which we can work together for the mutual benefit of the producers and the transporters. Success can only be attained through co-operation, and co-operation only through systematic organization.

As has been pointed out to you by President Connors, of your state board of agriculture, "The farmer's product is his medium of exchange." When he has a bale of cotton ready for market, he can always sell the cotton for the market price. The only value cotton has to the farmer is what he can sell it for, and anything that helps him get a better price puts that much more money in his pocket. Cotton is not perishable, and can be carried at a light charge in properly constructed warehouses. The larger part of the cotton crop of the South is taken from the fields to the railway station and sold by the farmers within a period of 90 days at the prevailing prices during that short time. If you would prepare to hold your cotton crop, or a portion of it, extending the season for selling through nine or ten months, instead of being forced to dispose of it at ginning time, you could select your own time to sell.

If this is considered a desirable thing for the Farmers' Union of Oklahoma, in-so-far as the lines for which I can speak, and no doubt other railway men feel as I do, we shall

extend every facility we can to the officers of your organization to carry out your plan of locating a chain of warehouses so that you can store your products in your own warehouses and market them to the best advantage and at the least expense. To do this and to do it successfully, it will be necessary for this branch of your organization to be handled under the same principles and business rules that govern other commercial enterprises.

We shall also be glad to join in formulating a plan to assist you in expeditiously marketing your perishable products. In so doing we will extend to the officers and agents of your organization every means and all reasonable facilities we can under the law to enable you to keep in touch with the cars shipped to the market so that you may know that your products are both properly transported and marketed.

Through such an organization the officer in charge of this branch of your business would have many details to work out, such as making arrangements with financial interests covering the issuance of negotiable warehouse certificates against your stored products, on which bankers will advance money. Also, in making contracts for the lowest insurance on which your warehouse products can be carried, in tracing your perishable shipments from the shipping station to the market, and in knowing that the commission merchants to whom your products are consigned handle them promptly and to your interest; in short, he should do everything possible to secure for you the largest return on your investment of capital and energy. This co-operation would bring your agents, who must necessarily travel over the country in looking after your business, in close contact with the railways' agents and representatives, who will at all times be glad to extend to you, or your representatives, every facility in promoting your business, which means the promotion of our business. In working together, we should work closely, openly, honestly and above board. Each needs the co-operation of the other, and the Farmers' Union of Oklahoma or any other state, confining its work to social and educational purposes, might continue indefinitely without securing the benefits to which its members are entitled. To secure such benefits and become a strong factor and profitable to members of your organization, a close working arrangement should be made with the railways, which will enable you to look after and control your products from the farms to the markets.

#### Freight Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 50, covering car balance and performance for February, 1909, says:

"As noted in the fortnightly bulletins of car surplus and shortage, there had been some reduction in the number of surplus cars, the average for February being 301,506 per day, or 14.32 per cent. of the total cars reported. The shop cars increased slightly, averaging 7.03 per cent. in February as compared with 6.93 per cent. in January.

"The adjustment due to the elimination of surplus good order and excess bad order cars from the averages gives results as follows:

	Average miles per day.		Average ton-miles per car per day.		Average earnings per car per day.	
	Inc. surp.	Exc. surp.	Inc. surp.	Exc. surp.	Inc. surp.	Exc. surp.
December, 1907	21.9	23.9	289	316	\$1.98	\$2.17
January, 1908	20.8	24.9	277	325	1.81	2.17
February, 1908	19.7	23.8	271	328	1.82	2.20
March, 1908...	21.2	25.5	290	348	1.95	2.34
April, 1908...	19.6	24.5	258	324	1.83	2.29
May, 1908...	19.3	24.8	254	329	1.72	2.22
June, 1908...	19.6	24.7	276	347	1.88	2.37
July, 1908...	20.0	24.8	275	342	1.84	2.26
August, 1908...	20.8	25.1	292	354	1.98	2.40
Sept., 1908...	22.0	25.2	320	367	2.24	2.57
October, 1908...	23.8	25.9	346	376	2.33	2.54
November, 1908	23.5	25.8	341	375	2.32	2.55
December, 1908	22.3	25.2	332	376	2.16	2.45
January, 1909	20.9	25.3	293	354	1.98	2.39
February, 1909	21.7	25.9	306	365	2.04	2.43

"It will be noted that the car movement shows some improvement over January, which is reflected in the average ton-miles and the average daily earnings per car, although the latter two items are still below the averages for the fall months of 1908. There is an increase in the number of cars



## CAR BALANCE AND PERFORMANCE IN FEBRUARY, 1909.

	New York, New Jersey, Del., Md., Eastern Pa.	Ohio, Indiana, Mich., Western Pa.	Virginia, W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minnesota.	Montana, Wyo., Neb., Dakotas.	Kansas, Okla., Ind. T., Mo., Ark.	Texas, Louisiana, N. Mex.	Oregon, Idaho, Nev., Cal., Arizona.	Canadian Lines.	Grand total.
Revenue freight cars owned.....	74,006	278,182	132,564	174,038	369,784	16,815	133,082	24,325	115,611	100,943	2,071,212
Average number of system cars on line..	55,215	212,887	93,436	124,034	287,822	7,110	95,004	14,276	64,083	80,221	1,486,404
Railroad-owned cars: Av. foreign on line	29,158	63,405	31,811	40,783	75,661	11,494	36,043	20,672	41,352	15,163	523,120
Total cars on line.....	84,373	276,292	125,247	164,817	363,483	18,604	131,047	34,948	105,435	95,384	2,009,524
Excess .....	10,367	.....	.....	.....	.....	1,789	.....	10,623	.....	.....	.....
Per cent. cars on line to total owned:											
Home .....	75	76	70	72	78	42	71	59	55	79	72
Foreign .....	39	24	24	23	20	69	27	85	36	15	25
All railroads .....	114	99	94	95	98	111	98	144	91	94	97
Private cars on line .....	3,426	11,234	3,489	6,026	13,104	1,104	5,877	1,959	8,269	3,273	96,235
Total cars on line.....	87,799	287,526	128,736	170,843	376,587	19,708	136,924	36,907	113,704	98,657	2,105,759
Per cent. of cars in shop .....	5.40	6.31	8.72	3.94	3.94	4.69	12.99	5.07	5.99	8.05	7.03
No. of freight engines owned.....	1,116	3,792	2,928	2,549	6,288	440	2,425	659	2,349	2,112	33,786
Av. cars on line per freight engine owned	79	76	58	67	60	45	56	56	48	47	62
Total freight-car mileage .....	39,284,484	150,008,143	73,830,227	102,734,905	234,101,723	18,211,705	74,499,324	25,557,199	80,266,190	67,243,353	1,278,662,172
Average miles per car per day.....	16.0	18.6	20.5	21.5	22.3	33.0	19.4	24.7	28.0	24.3	21.7
Per cent. loaded mileage .....	68.1	61.8	68.7	70.7	73.2	76.0	72.8	65.5	72.1	76.5	69.0
Ton-miles of freight, Inc. Co. freight.....	385,015,313	2,018,897,105	998,656,621	1,413,564,904	1,970,064,227	288,673,580	1,059,698,459	302,396,009	1,265,629,769	936,881,119	16,556,033,166
Average ton-miles, including Co. freight:											
Per car-mile .....	9.8	14.2	13.5	14.0	13.2	16.5	14.2	11.8	14.2	13.9	14.0
Per loaded car-mile .....	14.4	22.0	19.7	18.3	18.5	21.6	19.7	18.1	19.7	18.1	20.4
Per car per day .....	157	276	277	301	296	555	277	293	399	341	306
Gross freight earnings .....	\$4,407,965	\$11,733,093	\$7,329,168	\$9,630,221	\$16,419,539	\$2,062,660	\$8,823,125	\$2,749,191	\$11,283,324	\$5,693,019	\$114,762,191
Average daily earnings: Per car owned..	\$2.13	\$1.51	\$1.97	\$2.03	\$2.06	\$1.38	\$2.37	\$4.04	\$3.50	\$2.01	\$2.07
Per railroad-owned car on line.....	1.87	1.52	2.09	2.13	2.12	3.96	2.41	2.81	3.84	2.13	2.14
All cars on line .....	1.79	1.46	2.03	2.05	2.03	3.74	2.31	2.66	3.56	2.06	2.04

on their home lines, the average for the month being 72 per cent., the highest since September, 1908. Apparently this change was not at the expense of the loaded mileage, which averaged 69.0 per cent. as against 67.3 per cent. during January.

"The average tons per loaded car decreased from 20.6 in January to 20.4 in February, which is explained by a large decrease in the movement of coal and the heavier commodities, together with an increase in general traffic, indicated by the reports of surplus box and coal cars."

## COURT NEWS.

In the United States Circuit Court at Pittsburgh, Pa., the American Sheet & Tin Plate Co. has begun suit for damages against 56 striking employees. The claim is for \$200,000 damages, resulting from disturbance of the company's business by the strikers.

In the United States Circuit Court at Pittsburgh, August 17, an order was asked to restrain the striking machinists of the Baltimore & Ohio from interfering with the workmen at the Glenwood shops. It is stated in the bill of complaint that the men are members of the International Association of Machinists, and that some time prior to April 15, 1909, the company decided to inaugurate the piece work system in the shops; the men are stated to have gone on strike May 7. It is further set forth that the men causing the trouble are from Pittsburgh, Connellsville and Newcastle, and that they have been threatening workmen from these sections to such an extent that repair work has been seriously interfered with.

## INTERSTATE COMMERCE COMMISSION.

## Discrimination Through Elevator Lease.

*Brook-Rauch Mill & Elevator Co. v. Missouri Pacific et al. Opinion by Commissioner Harlan.*

The relations between the defendants and T. H. Bunch and the T. H. Bunch Co. examined, and it is held that the lease to Bunch, at a nominal rental, of an elevator erected by the defendants on their right of way at Argenta, Ark., operates as an unlawful preference in favor of Bunch and as an unjust discrimination against dealers and shippers of grain at Little Rock. The defendants are ordered to cease and desist from the continued performance of their contract and the aforesaid unlawful practices.

## Rates of George's Creek Coal Reduced.

*American Coal Co. of Allegany County et al. v. Baltimore & Ohio et al. Opinion by Commissioner Harlan.*

The defendants' rates on big-vein coal, from George's Creek basin in Allegany Co., Md., to tidewater, when going over the piers to destinations outside the Delaware and Chesapeake capes are unreasonable and unduly discriminatory and ought not to exceed the rates contemporaneously in effect on small-vein coal from the same district and on coals from the Meyersdale, Austen-Newburg and Upper Potomac districts in Pennsylvania and West Virginia when water borne to the same destinations. The defendants' rates on coals mined in George's Creek basin when destined to points in New York, Pennsylvania, New Jersey and New England are unreasonable and discriminatory and ought not to exceed the rates to the same destinations from the Meyersdale, Austen-Newburg and Upper Potomac regions.

George's Creek basin for 10 years or more has been grouped for rate-making purposes with the Meyersdale, Austen-Newburg and Upper Potomac coal-producing districts, and Philadelphia, Baltimore, Wilmington and other points of consumption for a like period of time have also taken a group rate from all these mines. No showing is here made justifying an order disturbing this grouping of coal-producing districts and coal-consuming destinations.

## REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JUNE, 1909.  
(See also issues of August 6 and 13.)

Name of road.	Mileage operated at end of period.	Operating expenses.				Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or dec.) income last year.
		Freight.	Passenger.	Misc.	Total.					
Alabama Great Southern.....	309	\$183,069	\$80,865	\$293,382	\$84,422	\$206,402	\$722	\$11,355	\$66,347	\$17,787
Boston & Maine.....	2,243	1,988,680	1,164,348	3,448,872	93,594	2,590,173	5,004*	157,985	695,710	65,337
Central of Georgia.....	1,916	451,104	225,010	749,604	111,397	1,437,946	3,894	43,568	156,940	965
Chicago & Alton.....	998	557,762	325,696	964,566	111,397	1,437,946	3,894	43,568	156,940	965
Chicago, Milwaukee & St. Paul.....	7,516	3,346,745	1,292,280	4,984,635	781,032	6,734,145	1,157	206,621	441,681	146,704
Chicago, Rock Island & Gulf.....	517	146,301	56,420	215,918	33,592	181,490	23,891	6,261	49,667	66,404
Cincinnati, Hamilton & Dayton.....	1,036	471,968	95,322	642,427	134,973	208,135	20,815	26,979	5,044	166,093
Cincinnati, New Orleans & Tex. Pac.....	337	513,181	122,437	749,423	63,793	115,089	19,470	20,003	241,736	50,394
Galveston, Harrisburg & San Ant.....	1,338	503,997	137,342	749,423	108,953	194,701	31,721	28,179	142,155	18,933
Great Northern.....	6,962	3,337,695	1,114,099	4,753,751	1,031,485	284,935	89,904	2,690,668	1,840,945	157,124
Illinois Central.....	4,550	2,724,147	926,860	4,242,674	619,493	1,029,991	93,436	2,737,446	1,579,326	333,201
International & Great Northern.....	1,159	367,051	151,412	566,682	137,081	233,371	26,808	27,164	1,279,326	151,807
Iowa Central.....	558	186,909	44,512	244,122	39,057	59,146	18,796	16,245	16,484	10,250
Long Island.....	391	230,812	57,821	349,714	83,116	102,232	31,156	99,196	321,073	115,781
Minneapolis & St. Louis.....	1,027	220,883	106,968	352,093	12,728	230,483	12,437	17,550	104,059	19,932
Mobile & Ohio.....	1,098	554,764	101,468	785,731	41,898	773,754	31,893	26,969	279,692	113,465
Morgan's L. & Tex. R.R. & S.S. Co.....	351	194,395	88,725	308,870	49,154	28,034	12,167	16,000	81,569	7,913
Nevada & California.....	422	62,776	33,899	103,933	13,208	9,632	1,893	6,208	34,512	41,046
Norfolk & Western.....	466	738,081	179,877	980,893	132,061	22,437	756,093	43,994	181,392	373,730
Northern Pacific.....	5,695	3,899,612	1,838,871	6,147,696	836,484	556,167	106,747	3,649,592	2,470,193	249,151
Oregon R.R. & Nav. Co.....	1,327	633,212	319,344	1,028,884	121,298	42,577	31,764	559,624	2,417,550	112,861
Pacific Short Line.....	1,509	1,105,008	432,148	1,629,646	145,071	147,933	28,973	659,444	970,202	223,437
Pacific & Eastern.....	351	156,172	34,782	214,782	35,341	34,129	5,456	164,544	64,239	55,439
Pere Marquette.....	2,336	770,921	317,614	1,155,678	164,732	41,484	30,177	866,771	278,345	97,133
Philadelphia & Reading.....	1,006	2,448,904	595,796	3,265,792	360,679	65,258	48,040	935,893	978,999	128,479
Pittsburgh & Lake Erie.....	468	150,203	81,898	265,591	36,862	26,721	9,229	100,252	70,339	61,086
Railroad & Grand Island.....	319	67,210	29,095	105,330	36,636	14,026	4,120	102,952	2,896†	35,780
St. Joseph & Grand Island.....	4,726	1,889,886	755,015	2,914,098	294,456	261,572	81,718	1,680,952	1,235,146	112,365
St. Louis & San Francisco.....	727	176,440	80,326	291,420	44,568	26,572	7,482	1,213,735	52,176	33,615
San Antonio & Aransas Pass.....	4,726	1,889,886	755,015	2,914,098	294,456	261,572	81,718	1,680,952	1,235,146	112,365
Southern Pacific—Al. S.S. Co.....	5,621	4,176,424	2,505,360	7,206,304	924,822	1,019,775	78,606	4,054,758	2,923,979	735,160
Southern Pacific—Cal. S.S. Co.....	458	203,948	77,021	304,250	44,905	35,591	7,362	205,558	98,692	20,422
Texas & New Orleans.....	451	223,905	36,507	294,195	28,790	12,908	7,970	123,908	17,287	87,556
Toledo, St. Louis & Western.....	356	132,004	34,920	209,518	37,837	18,247	9,343	325,631	157,431	80,237
West Jersey & Seashore.....	442	438,354	151,438	609,364	130,287	12,493	182,347	351,010	152,481	157,431
Wheeling & Lake Erie.....	442	438,354	151,438	609,364	130,287	12,493	182,347	351,010	152,481	157,431
Yazoo & Mississippi Valley.....	1,370	433,668	144,196	632,861	167,688	82,578	23,266	592,132	1,653†	120,490
Alabama Great Southern.....	309	2,259,332	944,447	3,560,292	434,318	1,157,036	100,680	2,454,906	1,105,386	401,324
Boston & Maine.....	2,243	23,014,438	13,451,751	39,526,698	4,251,506	12,507	964,595	28,263,855	11,264,843	1,186,207
Central of Georgia.....	1,916	7,430,496	2,744,115	11,155,182	4,730,779	516,417	443,937	7,867,827	2,866,867	383,375
Chicago & Alton.....	998	7,672,924	3,824,739	12,532,363	1,544,714	3,432,075	43,937	4,897,827	2,866,867	383,375
Chicago, Milwaukee & St. Paul.....	7,516	42,341,650	12,774,851	59,897,463	1,988,869	4,758,852	3,363,329	7,256,732	5,275,651	801,256
Chicago, Rock Island & Gulf.....	517	2,133,163	733,511	3,014,731	728,429	1,334,006	1,073,682	2,428,675	1,891,232	968,113
Cincinnati, Hamilton & Dayton.....	1,036	5,490,390	1,582,760	7,897,047	1,070,363	2,556,227	99,812	5,088,840	2,925,891	36,064
Cincinnati, New Orleans & Tex. Pac.....	337	5,995,669	1,417,496	7,899,971	1,303,694	2,596,028	253,121	6,501,593	1,959,452	325,429
Galveston, Harrisburg & San Ant.....	1,338	7,253,944	2,227,856	9,999,971	1,303,694	2,596,028	253,121	6,501,593	1,959,452	325,429
Great Northern.....	6,962	39,473,867	10,979,957	53,658,463	9,786,665	11,265,627	1,158,427	32,524,547	15,256,698	775,102
Illinois Central.....	4,550	5,846,418	1,718,376	8,097,939	1,467,427	3,336,805	200,055	6,598,145	1,499,794	250,355
International & Great Northern.....	1,159	2,359,556	524,348	3,265,792	469,247	1,036,028	107,370	2,471,672	543,975	107,638
Iowa Central.....	558	2,713,349	524,348	3,265,792	469,247	1,036,028	107,370	2,471,672	543,975	107,638
Long Island.....	391	279,605	1,076,984	4,171,315	1,039,773	1,249,144	157,094	3,625,071	1,961,245	582,521
Minneapolis & St. Louis.....	1,027	2,796,605	1,076,984	4,171,315	1,039,773	1,249,144	157,094	3,625,071	1,961,245	582,521
Mobile & Ohio.....	1,098	1,128,687	1,214,599	9,727,726	1,403,469	1,431,711	334,149	6,589,648	3,138,678	324,654
Morgan's L. & Tex. R.R. & S.S. Co.....	351	3,178,541	1,060,513	4,335,845	726,453	473,084	103,221	3,673,096	1,408,671	241,437
Nevada & California.....	422	757,718	175,951	1,126,192	147,455	140,532	9,162	234,398	307,504	117,441
Norfolk & Western.....	466	8,852,736	2,068,609	11,534,905	1,154,665	2,386,688	153,426	9,070,140	2,464,705	334,323
Northern Pacific.....	5,695	47,073,305	17,330,608	68,460,747	8,447,050	20,305,621	1,102,443	38,020,004	30,440,743	2,018,834
Oregon R.R. & Nav. Co.....	1,327	8,448,213	3,398,314	12,666,747	1,340,033	891,256	308,564	4,066,716	6,219,813	1,360,028
Pacific Short Line.....	1,509	12,591,282	4,132,281	17,754,586	1,634,832	2,387,797	3,886,590	353,747	5,546,769	1,947,358
Pere Marquette.....	351	1,909,826	661,005	2,802,816	361,164	453,431	62,617	1,096,594	9,872,026	1,808,794
Pere Marquette & Reading.....	2,336	9,705,564	3,366,466	14,069,564	1,669,220	2,018,494	349,191	10,107,195	4,062,369	177,885
Philadelphia & Reading.....	1,006	31,244,954	6,182,421	39,060,233	3,319,800	7,553,633	686,346	32,824,555	14,836,329	816,598
Pittsburgh & Lake Erie.....	468	1,586,061	987,877	2,895,916	437,002	406,435	66,784	2,990,833	805,083	123,875
Railroad & Grand Island.....	319	1,064,211	377,113	1,562,113	298,872	176,348	45,407	1,127,339	43,474	386,068
St. Joseph & Grand Island.....	4,726	23,759,532	9,124,160	35,651,389	4,329,525	812,455	1,098,974	23,168,971	12,482,472	1,981,081
St. Louis & San Francisco.....	727	2,690,035	874,825	3,565,654	4,700,887	1,491,888	106,164	2,664,871	1,102,783	198,174
San Antonio & Aransas Pass.....	4,726	2,690,035	874,825	3,565,654	4,700,887	1,491,888	106,164	2,664,871	1,102,783	198,174
Southern Pacific—Al. S.S. Co.....	5,621	49,215,877	26,734,488	61,142,224	10,015,328	10,567,135	2,347,864	53,470,789	32,678,188	4,580,518
Southern Pacific—Cal. S.S. Co.....	458	5,588,138	468,248	6,142,224	635,029	515,074	99,305	5,370,950	801,455	291,657
Texas & New Orleans.....	451	2,455,889	850,907	3,338,835	374,456	277,123	95,363	2,077,721	644,898	36,883
Toledo, St. Louis & Western.....	451	2,734,152	456,963	3,496,644	374,456	277,123	95,363	2,077,721	644,898	36,883
West Jersey & Seashore.....	356	1,490,822	3,263,432	5,044,785	807,161	663,993	124,076	3,768,766	1,092,953	333,856
Wheeling & Lake Erie.....	442	4,804,421	497,714	5,633,645	617,956	1,380,978	74,231	4,200,718	1,432,927	312,866
Yazoo & Mississippi Valley.....	1,370	7,010,299	2,059,703	9,670,343	2,042,511	1,665,463	190,836	7,934,294	1,736,019	104,400

\*Deficit. †Loss. ‡Decrease. (a) Credit.



## STATE COMMISSIONS.

The Kansas Railway Commission has prepared a blank form on which it will require railways to report monthly the total number of trains run on each operating division, the number of trains on time, the number of trains late and the average number of minutes each train is late, after the manner of the reports now made in New York. It also requires information as to causes of delay.

The Indiana Railroad Commission has ordered the Chicago, Indianapolis & Louisville to reduce its rates on coal, sand and gravel from 20 to 40 per cent. on practically all of its lines from New Albany to Monon, including the branches running from Bedford and Wallace Junction to Victoria, and on the Indianapolis branch between Monon and Broad Ripple. The order was made after hearing on a petition of Edward T. Slider, of New Albany, a wholesale dealer in coal, sand and gravel for public improvement purposes. Mr. Slider gets his sand and gravel from the bed of the Ohio river and receives his coal in barges from Pittsburgh and distributes them to points on the Monon.

Chairman Mayfield, of the Railroad Commission of Texas, announced on August 11 that the commission had decided not to make any reduction in the rates on cotton. He said the commissioners were unanimous that there ought to be a reduction in the rates on cotton as soon as the revenues of the railways will warrant it; but he had traveled over the central and northwestern parts of the state within the last 10 days, and he had never seen such a sorry prospect for crops. The commission within the present calendar year had required the railways directly interested in the transportation of cotton to make extensive improvements and if the roads' revenues were cut down now they would be unable to make these improvements. Consequently the matter of rates on cotton was postponed until the February term. Statements in Texas newspapers indicate that the decision of the commission not to act on this matter will stimulate construction work on a number of new railways, the promoters of which expect now to secure capital more easily.

The New York Public Service Commission, Second district, has denied the application of the Central New England for consent to make a mortgage of \$20,000,000 and to issue bonds to the amount of \$12,910,000. The application submitted was the plan of the New York, New Haven & Hartford. The Central New England has outstanding common stock \$4,800,000, preferred stock \$3,750,000, total \$8,550,000. Of this stock the New York, New Haven & Hartford owns common \$4,415,395, preferred \$3,410,377 total \$7,825,772. The Central New England has outstanding funded and other indebtedness the principal of which amounts to \$12,320,500. Of this indebtedness the New Haven company holds \$9,989,123 and third parties \$2,331,377. Among such indebtedness are general mortgage income bonds amounting to \$7,250,000, of which the New Haven company owns \$6,329,123 and other parties \$920,877. These bonds have been outstanding 10 years and no interest has ever been paid on them. Another issue of income bonds for which the Central New England is liable and which has been outstanding since 1887 and on which no interest has ever been paid amounts to \$1,164,500, of which the New Haven company owns \$1,164,000 and other parties \$500. It is proposed to issue 4 per cent. interest bearing bonds in the place of all the income bonds owned by the New Haven company except about \$1,000,000. Other parties have no right under the proposed mortgage to exchange their income bonds for interest bearing bonds. The proposed mortgage while ostensibly drawn to refund all the outstanding indebtedness of the applicant is so made that no bonds can be issued by the trustee to refund outstanding bonds unless such outstanding bonds are presented by either the applicant or the New Haven company. The amount of bonds owned by others which cannot be refunded as of right is \$2,331,377. The commission holds that a refunding scheme which embraces the securities held by only one creditor and that creditor in control of the applicant through stock ownership cannot be approved. The commission is willing, however, to consider and approve any reasonable plan for the readjustment of the somewhat complicated financial situation of the applicant.

## Railroad Officers.

## ELECTIONS AND APPOINTMENTS.

## Executive, Financial and Legal Officers.

William Cotter has been elected president of the Cincinnati, Hamilton & Dayton. O. G. Murray has been elected chairman of the board.

H. M. Watkins has been appointed the auditor of freight accounts of the Oregon Railroad & Navigation Co., with office at Portland, Ore.

E. S. Hartwell has been elected the secretary and auditor of the Colorado Springs & Cripple Creek District, with office at Colorado Springs, Colo., succeeding L. F. Linney.

C. G. Root, vice-president and general manager of the Erie & Michigan Railway & Navigation Co., has been elected the president, retaining also the duties of general manager, with office at Chicago. S. T. Meservey has been elected the vice-president, with office at Chicago.

## Operating Officers.

C. H. Huddleston has been appointed a superintendent of the Missouri, Kansas & Texas of Texas, with office at Trinity, Tex., succeeding A. M. Acheson, promoted.

F. E. Hutchinson has been appointed the chief electrician of the Rock Island Lines, with office at Chicago, succeeding W. E. Ballantine, resigned to accept service with another company.

William Connolly, assistant superintendent of the Oregon Railroad & Navigation Company at Portland, Ore., has been appointed the superintendent of the Washington division, with office at Spokane, Wash., succeeding Thomas Walsh, resigned. J. D. Matheson, trainmaster at La Grande, Ore., succeeds Mr. Connolly.

F. G. Faulkner, chief train despatcher of the St. Louis & San Francisco at Newburg, Mo., has been appointed an assistant superintendent, with office at Newburg. Mr. Faulkner formerly held this position, but during the retrenchment period on the Frisco the office was abolished and he was appointed the chief train despatcher.

## Traffic Officers.

W. D. Granbury has been appointed the passenger and freight agent of the Texas State Railroad.

A. L. Craig, general passenger agent of the Great Northern, with office at St. Paul, Minn., has resigned.

H. R. Higgins has been appointed a commercial agent of the Southern Railway, with office at San Francisco, Cal.

W. G. Taggart has been appointed a traveling freight agent of the Pittsburgh & Lake Erie, with office at Youngstown, Ohio.

J. R. Jordan has been appointed a commercial agent of the Louisiana Railway & Navigation Co., with office at Baton Rouge, La.

C. D. Turner has been appointed the southern freight agent of the Erie, with office at Chicago, succeeding L. H. Geller, transferred.

R. E. Whitehead has been appointed a soliciting freight agent of the Nashville, Chattanooga & St. Louis, with office at St. Louis, Mo.

M. J. Geary has been appointed a general agent, passenger department, of the Chicago, Rock Island & Pacific, with office at Portland, Ore.

A. N. Johnson has been appointed a general agent of the Chicago Great Western, with office at Butte, Mont., succeeding L. M. Foss, promoted.

W. H. Bryning, assistant general freight agent of the St. Joseph & Grand Island at St. Joseph, Mo., has been appointed a general agent, with office at St. Louis, Mo.

L. H. Mussman has been appointed a commercial agent of



the Cleveland, Cincinnati, Chicago & St. Louis, with office at Cairo, Ill., succeeding H. H. Roseman, resigned.

J. A. Brown, chief clerk in the freight department of the St. Louis & San Francisco at New Orleans, La., has been appointed an assistant general freight agent, with office at New Orleans.

Charles J. Brooks, division passenger agent of the Chicago Great Western, with office at Fort Dodge, Iowa, has had his jurisdiction extended over the line from Sumner, Iowa, to Waverly.

W. J. Van Camp, contracting freight agent of the Atchison, Topeka & Santa Fe at Denver, Colo., has been appointed a contracting agent of the Central Savannah Line, with office at Denver.

George M. Rowell has been appointed a traveling freight agent of the Central of Georgia, with office at Chicago. W. E. Stewart has been appointed a commercial agent, with office at Chattanooga, Tenn.

E. S. Newhouse, contracting freight agent of the Texas & Pacific at New Orleans, La., has been appointed a traveling freight agent of the St. Louis, Iron Mountain & Southern, with office at Natchez, Miss.

T. D. Brennan has been appointed a traveling freight agent of the Kansas City Southern, with office at Pittsburgh, Pa. C. E. Gott has been appointed a contracting freight agent, with office at Pittsburgh, Pa.

The office of F. G. Frieser, foreign freight agent of the Denver & Rio Grande, the International & Great Northern, the Missouri Pacific and the Texas & Pacific, has been transferred from St. Louis, Mo., to Chicago.

J. D. Gowin, traveling freight agent of the Rock Island-Frisco lines at Dallas, Tex., has been appointed a traveling freight agent, with office at Fort Worth, Tex., succeeding I. G. Thompson, resigned. W. W. Wallace succeeds Mr. Gowin.

J. G. Bliss, clerk in the general freight offices of the Cincinnati, New Orleans & Texas Pacific, has been appointed a soliciting freight agent, with office at Cincinnati, Ohio, succeeding I. F. Hall, resigned to take service with another company.

J. T. McGaughey, general agent, freight department of the Great Northern at Minneapolis, Minn., has been appointed an assistant general freight and passenger agent, with office at Helena, Mont., succeeding H. A. Jackson, transferred. G. H. Smitton succeeds Mr. McGaughey.

T. J. T. Hayes, traveling freight agent of the Southern Railway at Knoxville, Tenn., has been appointed a commercial agent, with office at Johnson City, Tenn. C. E. Rising succeeds Mr. Hayes, with office at Knoxville. W. T. Rembert has been appointed a commercial agent, with headquarters at Dallas, Tex.

George Krause, Jr., commercial agent of the Cleveland, Cincinnati, Chicago & St. Louis at Cleveland, Ohio, has been appointed a division freight agent, with office at Cleveland, succeeding to the duties of A. B. Hough, assistant general freight agent, resigned. E. F. Borges succeeds Mr. Krause and will report to him.

D. Lumpkin, assistant treasurer and freight claim agent of the Durham & Southern, has been appointed the acting general freight and passenger agent, with office at Durham, N. C., succeeding S. H. Reams, general freight and passenger agent, resigned. Burke Hobgood has been appointed a soliciting freight and passenger agent, with office at Durham.

A. L. Evans, eastbound agent of the Western Transit Co., has been appointed the general eastbound agent, with office at Minneapolis, Minn. A. T. Connolly succeeds Mr. Evans, with office at Minneapolis. George C. Williams has been appointed a general agent, with office at Chicago. Gibson L. Douglas has been appointed a general agent, with office at Duluth, Minn.

#### Engineering and Rolling Stock Officers.

A. M. Acheson, superintendent of the Missouri, Kansas & Texas of Texas at Trinity, Tex., has been appointed the acting

chief engineer, with office at Dallas, Tex., succeeding J. W. Petheram, resigned on account of illness.

F. J. Barry has been appointed the general inspector in charge of air brakes, steam heat and lighting of the New York, Ontario & Western, with office at Middletown, N. Y.

C. L. Dougherty has been appointed the acting mechanical engineer of the Cleveland, Cincinnati, Chicago & St. Louis, with office at Indianapolis, Ind., succeeding B. D. Lockwood, resigned to engage in other business.

W. McIntosh, master mechanic of the Illinois Central at East St. Louis, Ill., has been transferred to Memphis, Tenn. Joseph Walker, general foreman of the East St. Louis shops, succeeds Mr. McIntosh, with office at East St. Louis. James Hofflich, roundhouse foreman at East St. Louis, succeeds Mr. Walker.

C. H. Gerber, assistant engineer in the office of the chief engineer of the Union Pacific at Omaha, Neb., has been appointed the first assistant engineer on physical valuation for the state railway commission of Nebraska. Mr. Gerber was with the Union Pacific for nine years, having been connected with the construction department as assistant to the resident engineer, and later becoming resident engineer, in charge of work including the Lane cut-off out of Omaha, second track between Lane, Neb., and Kearney, the extension of several branches, and permanent bridge work.

#### Purchasing Officers.

T. J. Frier, whose appointment as the purchasing and supply agent of the Wabash, with office at St. Louis, Mo., succeeding C. A. How, was announced in these columns recently,



T. J. Frier.

was born February 12, 1866, at Keokuk, Iowa, and received his education in a Roman Catholic parochial school. He began railway work May 1, 1883, as clerk in the storehouse of the Chicago, Burlington & Quincy at Keokuk, and afterwards was time-keeper, chief clerk to the master mechanic, and storekeeper, filling the latter position at St. Joseph, Mo., and Hannibal, Mo. He was appointed supply agent of the Missouri lines January 1, 1903, and was appointed assistant supply agent of the Lines East of the Missouri River in 1904. In July, 1905, he was appointed supply agent, and in April, 1907, was appointed general storekeeper.

#### OBITUARY.

W. J. Taylor, general baggage agent of the International & Great Northern at Palestine, Tex., died in that city on August 14.

Charles W. Hammond, formerly for many years superintendent of telegraph of the Missouri Pacific System, died at St. Louis, Mo., August 13, at the age of 72 years. He entered the telegraph service in 1853 at Perrysburg, Ohio, which he left to join the Union army during the civil war. He resigned from the army in 1862 and was connected with the telegraph service in different capacities until the consolidation of the American Union Company and the Western Union Telegraph Company, when he became superintendent of telegraph of the International & Great Northern and the Texas & Pacific and later had supervision over the Missouri Pacific System. He resigned from that position about five years ago.

## Railroad Construction.

### New Incorporations, Surveys, Etc.

**AROOSTOOK VALLEY (ELECTRIC).**—An officer writes that half of the grading is completed on the proposed line from Presque Isle, Maine, to Washburn, 12 miles. Murry Brothers have the contract. The work includes a 600-ft. bridge. The maximum grade will be 0.5 per cent. and maximum curvature 5 deg. The line is to be laid with 70-lb. rails. Direct current at 1,200 volts will be furnished by the Maine & New Brunswick Electrical Power Co., Aroostook Falls, N. B. A. R. Gould, president, Presque Isle.

**ARTESIAN BELT.**—According to press reports this road is now in operation from Macdonna, Tex., south for 20 miles in the southern part of Bexar county, and forms a connecting link between the Southern Pacific and International Great Northern. The line is eventually to be extended to Simmons City, in Live Oak county, and probably to Brownsville. Dr. C. F. Simmons is the principal promoter. William Bradburn, chief engineer, 215 Alamo Plaza, San Antonio, Tex. (March 19, p. 651.)

**ATCHISON, TOPEKA & SANTA FE.**—According to press reports work is to be started soon on the Arizona & California to finish the remaining 90 miles from the bridge over the Colorado river near Parker, Ariz., west to Bengal, Cal. (March 19, p. 651.)

**ATLANTA, BIRMINGHAM & ATLANTIC.**—According to press reports this company has been compelled to suspend all work on the extension to Birmingham, pending a change in the law recently passed by the Alabama legislature. The new law is said to make it impossible for the company to secure a right-of-way unless the owners are willing to sell. (July 23, p. 167.)

**BUFFALO, ROCHESTER & PITTSBURGH.**—The report of this company for the year ended June 30, 1909, shows that the new second track work between Brockwayville, Pa., and Carman, 9.19 miles, has been finished, some second track was also laid at Cloe, Pa. Sidings and yard extensions were added and improvements made to a number of bridges and culverts. The company is building jointly with the New York Central & Hudson River a subway in the town of Gates, near Rochester, N. Y., to eliminate a dangerous grade crossing. Work has been started on the Clearfield & Mahoning improving the alignment and strengthening the bridges to carry heavier rolling stock.

**CANADIAN PACIFIC.**—According to press reports the improvements on the main line between Field, B. C., and Hector are finished. The work included the excavation of 650,000 cu. yds. of rock, the boring of one and one-half miles of tunnels and building two bridges over the Kicking Horse river. The new line will reduce the grade from  $4\frac{7}{10}$  per cent. to a maximum of  $2\frac{2}{10}$  per cent. The cost of the work was \$1,500,000. (March 19, p. 660.)

**CENTRAL OREGON & PACIFIC.**—Incorporated in Oregon, with \$50,000 capital, with office at Portland. The plans call for a line from Albany, Ore., east across the Cascade range to Ontario, in Malheur county, on the Idaho boundary, 325 miles. The incorporators include: F. T. Griffith, D. B. Smith and C. H. Warner.

**CHICAGO & NORTH WESTERN.**—Plans are said to have been made to build a line from Ravinia, Ill., on the Milwaukee line of the C. & N. W. near Highland track, westerly via the Wisconsin division at Des Plaines, thence to the Galena division, probably near Oak Park or at Proviso yards. This will furnish the company an independent route without using the Elgin, Joliet & Eastern or Inner Belt line.

**CHICAGO, BURLINGTON & QUINCY.**—Grading has been started by the McArthur Brothers Co., Chicago, on the line from Kirby, Wyo., south to Shoshone, 42 miles. The work will be heavy, being mostly through rock, and will include eight short tunnels, ranging from 150 to 900 ft. respectively. There will also be three steel bridges over the Big Horn river. (Aug. 13, p. 296.)

Contract is said to be let to the Carter Construction Co., of Chicago, and work is to be started at once on the extension from Herrin, Ill., south to Metropolis, 57 miles. The work includes a tunnel. It will take about two years to complete the line. (July 16, p. 124.)

**CHICAGO, ROCK ISLAND & GULF.**—The Tucumcari & Memphis, under construction from Amarillo, Tex., west to Tucumcari, N. Mex., 110 miles, has been opened for operation for the first 49.2 miles from Amarillo. (June 25, p. 1545.)

**CLARK COUNTY SUBURBAN.**—See Vancouver Traction.

**CLEARFIELD & MAHONING.**—See Buffalo, Rochester & Pittsburgh.

**CLEVELAND, BARBERTON, COSHOCTON & ZANESVILLE (ELECTRIC).**—Organized to build from Cleveland, Ohio, south to Zanesville, about 120 miles, with branches to Elyria, Rittman, Millersburg and Cambridge, a total of about 190 miles, all of which, with the exception of 12 miles, is to be over a private right-of-way. A mortgage was recently filed with the Windsor Trust Co. of New York to secure an issue of \$6,000,000 of bonds. J. J. Breiting, president; W. E. Brooks, vice-president, Elyria.

**COLORADO & SOUTHEASTERN.**—Organized in Colorado, with \$200,000 capital and office at Denver, by the Colorado Fuel & Iron Co. interests, to build from Trinidad, Colo., north to Pueblo, thence west to Florence, 120 miles. Branches are to be built to coal fields from Trinidad and from Florence to Rockvale and Chandler. The incorporators include: G. W. Boven, W. H. Huff, W. J. Murray, G. F. Bartlett, Jr., and S. L. Heyn, all of Denver, Colo.

**CRYSTAL CITY & UVALDE.**—Organized to build from Uvalde, Tex., south to Crystal City, 42 miles. According to press reports the line is now in operation on 12 miles from Uvalde to the Nueces river and work is under way on a bridge over that river. Most of the grading is finished to Crystal City. (April 30, p. 960.)

**DENVER & RIO GRANDE.**—This company has recently sold bonds and it is said will use the proceeds for extensive revision of grades and lines, putting in double tracks and other betterment work.

**EASTERN INDIANA.**—Incorporated in Indiana, with \$50,000 capital, to build 16 miles of line from the Michigan City docks on Lake Michigan to a point on the lake in township 27, range 5. The directors include: C. B. Collins, A. C. Weiler, R. F. Garretson, J. B. Collins, E. N. Moran and H. A. Schwager, Michigan City, and W. J. Riley, of East Chicago.

**GRAND TRUNK PACIFIC.**—Contracts for building 130 miles, it is said, are about to be let. The work to be carried out is on a section in British Columbia from the eastern end of the present contract east, and will involve the removal of 1,500,000 cu. yds. of rock.

**GREAT NORTHERN.**—According to press reports plans have been made to rush construction work on the line from Oroville, Wash., down the valley of the Okanogan river to Brewster. The line is eventually to be extended south 70 miles to Wenatchee, 130 miles south of Oroville, traversing the west side of the Colville Indian reservation through the Entiat and Meadow valleys, Brewster flats, Bridgeport and Okanogan valley, all of which are large fruit producing districts. The company also proposes to carry out additional work as follows: Double tracking the line between Seattle, Wash., and Everett, 34 miles; new branch from Bainville, Mont., north to Plentywood, 50 miles, near the Canadian boundary, the route follows the Big Muddy creek and along the eastern border of the Fort Peck Indian reservation, which will probably be opened to settlers next year; a short branch from Stanley, N. Dak., north to Powers lake, 20 miles. (March 19, p. 654.)

Bids are said to be wanted August 20 for building a line from Great Falls, Mont., east to Belt. This project has been under consideration since work was started on the Billings & Northern branch. It is expected that the work will be started early this fall. The new line will eliminate the heavy grades on the existing line between Gerber and Belt and will be about 18 miles long. There will be some tunnel work to permit



the line to leave Creek valley without passing over the bluff. It is estimated that the work will cost \$1,000,000 and involve the handling of 2,000,000 cu. yds. of earth.

**GULF, SOASH & PACIFIC.**—Incorporated in Texas with \$50,000 capital and office at Big Springs. The plans call for a line from Big Springs, in Howard county, Tex., northwesterly via Borden county, to a point near the north line of township five, east of the town of Lamesa, in Dawson county. The incorporators include: N. H. Lassiter, Fort Worth; L. S. McDowell, W. Fisher, B. Reagan and M. Hiserote, Big Springs; H. G. Jackson, Soash; D. Soash, G. A. Leonard, C. C. Wolf, W. P. Soash and W. T. Evans.

**GULF, TEXAS & WESTERN.**—According to press reports this road will be put in operation on August 25 from Jacksboro, Tex., west to Jeanette, seven miles, and from Olney east to Royalton, 10.4 miles. The line is projected from Burrs Ferry, Tex., northwest to Benjamin, about 500 miles. B. B. Cain, vice-president, Tyler, Tex. (July 16, p. 124.)

**HARRISVILLE & CORNWALLIS.**—An officer writes that this line is under construction from Harrisville, W. Va., to Cornwallis, six miles. It is projected from Harrisville to Burnsville, 45 miles. B. F. Patton, general manager, Harrisville; A. Wolverton, chief engineer, Philippi. (March 19, p. 654.)

**IDAHO & WASHINGTON NORTHERN.**—Work on the 1,100-ft. tunnel at Blueside, Wash., is sufficiently advanced to begin track laying. The tunnel is to be 22 ft. wide and 24 ft. high. On the extension north to Ione, track has been laid to a point north of Cusick, and it is expected to have the entire line ready for operation before the coming winter. (July 23, p. 168.)

**INTERNATIONAL & GREAT NORTHERN.**—An officer writes that 80-lb. rails are being laid from Houston, Tex., to a point about 30 miles north on the main line. Creosoted ties are being put in and the line will be ballasted with 12 in. of sea shell.

**LAKE ERIE & YOUNGSTOWN (ELECTRIC).**—Organized to build from Conneaut, Ohio, south via Andover to Youngstown, about 60 miles. According to press reports work is to be started at once by the Stanley Contracting Co., which has the general contract to build the line. W. F. Stanley, of Conneaut, is one of the principal promoters. (July 2, p. 35.)

**LOUISIANA RAILWAY & NAVIGATION Co.**—A new branch called the Tioga branch has been opened from Pineville, La., to Ems, 7.1 miles.

**MEMPHIS, PARIS & GULF.**—An officer is quoted as saying that two preliminary surveys have been made for an extension from Ashdown, Ark., west, one via Richmond, Ark., and Clarksville, Tex., thence southwest to Greenville, 130 miles, and the other via Richmond to Paris, 85 miles. Preliminary surveys for the eastern extension were finished some time ago from Murfreesboro, northeast, via Amity to Hot Springs, as well as via Glenwood to Hot Springs, also east via Graysonia and Arkadelphia to Pine Bluff, 150 miles. (March 19, p. 655.)

**MEXICAN ROADS.**—Jacinto Pimental has been authorized to build and operate for a period of 50 years a line from La Viga, Mex., through San Esteban to La Viga Rancho.

The Mexican Tramway Company has been authorized to build new lines and to re-locate and make improvements and alterations to the existing lines.

**MEXICAN TRAMWAY Co.**—See Mexican Roads.

**MISSOURI ROADS.**—According to press reports from St. Louis, Mo., Daniel F. Miller, formerly of Brooklyn, is back of a company being organized with \$15,000,000 capital to build a line from Kansas City, Mo., to St. Louis.

**MOUNTAIN VALLEY & PLAINS.**—According to press reports active work is to be started about October on this line, projected from Cimarron, N. Mex., east through the Panhandle of Texas to Guthrie, about 450 miles. D. W. Herrington is interested and J. H. Conlin is chief engineer, both of Dalhart, Tex. (Jan. 8, p. 89.)

**NASHVILLE, CHATTANOOGA & ST. LOUIS.**—According to press reports plans are being made to straighten the line, cut down the grades and build a new tunnel near Summit, Tenn., Wauhatchie and Hooker, Ga.

**NEVADA ROADS.**—Regarding the press reports that a line is to be built from Ely, Nev., southwest to Goldfield, we are told there is nothing certain as yet regarding this line. Surveys have not been made and other necessary data not yet received. M. E. Bernheimer, 39 West Seventy-second street, New York, may be addressed.

**NEW ORLEANS & GULF STATES.**—Incorporated in Louisiana, with \$5,000,000 capital, to build from New Orleans, La., east to Pensacola, Fla. This is believed to be a Rock Island-Frisco project, as a number of the incorporators are said to be identified with the Frisco interests.

**NEW ORLEANS GREAT NORTHERN.**—This road has been extended from Hopewell, Miss., north to Jackson, 26 miles. A new branch, called the Columbia branch, has been opened for business from West Columbia, Miss., to Columbia, three miles.

**NORTH COAST.**—Contract is said to have been given to J. Bruce & Co., of Spokane, Wash., for building the section from Granger, Wash., northwest to North Yakima, about 25 miles. (July 30, p. 215.)

**NORTHERN PACIFIC.**—According to press reports a general contract has been given to Grant Smith to build the first 40 miles of the proposed cut-off from Missoula, Mont., west to Lola Pass at the Bitter Root mountains. The line will later run into the state of Washington. Sub-contracts are to be let soon and active work is expected to be started in September. (July 23, p. 168.)

The Bitter Root branch on the Rocky Mountain division has been extended from Hamilton, Mont., southward to Darby, 16 miles.

According to press reports a contract has been given to Winston Brothers, Minneapolis, Minn., for double-tracking the road between Tacoma, Wash., and Kalama. The contract is valued at about \$1,600,000.

**NORWOOD & ST. LAWRENCE.**—This road has been extended from Raymondville, N. Y., west to Waddington, 13 miles. (March 19, p. 656.)

**OREGON SHORT LINE.**—According to press reports plans are being made to build a line to be known as the Rupert-Wendell-Bliss cut-off, to shorten the distance about 70 miles from Salt Lake City, Utah, north to Bliss, Idaho.

**OREGON TRUNK LINE.**—According to press reports from Portland, Ore., Porter Brothers, railway contractors, are back of a project to build from The Dalles, in the northern part of Oregon, south through the Des Chutes river valley to Madras, in central Oregon, 122 miles. The work for about 80 or 90 miles will be heavy and expensive. The right-of-way for the first section of 110 miles has been approved by the government; the cost of this section will be about \$5,000,000. Although it is said the Hill interests are not identified with this project, it is thought to be part of a Harriman-Hill contest for entrance into that section. The Hill interests, it is said, are sending construction crews into the Harriman territory in central Oregon, while the Harriman Lines have already begun work on the Des Chutes Railroad, building from near Des Chutes south to Redmond, 130 miles.

**PACIFIC RAILWAY & NAVIGATION Co.**—According to press reports this line will be in operation this month on the first 17 miles from Hillsboro, Ore., west, and on 11 miles from Tillamook east. A total of about 33 miles are finished and 1,000 men are said to be at work on 27 additional miles. It is expected to have the entire line finished by January, 1910. (May 28, p. 1145.)

**PEORIA & GALESBURG (ELECTRIC).**—Projected from Peoria, Ill., to Galesburg, with a branch from Farmington to Canton, 10 miles, to be built at once. The route follows the line of the Iowa Central from Peoria to Farmington, thence northwest to Maquon, thence near the Chicago, Burlington & Quincy to Knoxville, and then east to Galesburg, 50 miles. Further extensions are under consideration, including a line from Galesburg south to St. Louis. B. R. Stephens, president and general manager, Springfield, Ill.

**QUANAH, ACME & PACIFIC.**—This road, it is said, was opened for business on August 16 from Quanah, Tex., to Lazare, 14.74 miles. The road is being extended southwest to Paducah, in Cottle county, and is eventually to be extended to Roswell, in Mexico; in all, 250 miles. (June 25, p. 1546.)



**SEATTLE-TACOMA SHORT LINE (ELECTRIC).**—A contract has been entered into with H. A. Eastman and E. J. Felt, of Tacoma, Wash., to finance and construct this line. This is to be accomplished through the sale of an issue of \$3,000,000 of bonds. A. P. Pritchard, A. E. Rothermel and C. E. Muckler, of Tacoma, are directors.

**SOUTHERN RAILWAY.**—The 1,300-ft. tunnel being built by the Southern Railway through Lynchburg, Va., was recently damaged by fire, with an estimated loss of \$100,000. The work, which was started about four years ago, has been progressing very slowly, due to the presence of quicksand and mica. About 1,000 ft. of the lower level has been pierced through solid granite. This is part of the second track work being carried out between Winesap and Burmid, 6.9 miles. (March 19, p. 658.)

**SOUTHERN TRACTION CO. OF ILLINOIS.**—Organized in February, 1908, to build from East St. Louis, Ill., southeast via Centerville Station and Belleville to Murphysboro, about 75 miles, and eventually south to Cairo. The company recently filed a mortgage to secure an issue of \$1,500,000 of bonds. F. P. Ernest, president; H. C. Begole, secretary, and R. V. Clark, treasurer, of East St. Louis.

**SPOKANE, WALLA WALLA & WESTERN (ELECTRIC).**—Incorporated in the state of Washington, with \$3,000,000 capital, to build or buy interurban lines in the states of Washington, Oregon and Idaho. The incorporators include: E. M. Symonds, G. S. Hynes, A. H. Hoffman, M. S. Parker and E. C. Moxon, all of Spokane; W. L. Russell, of Walla Walla, and M. R. Hanger, of Dayton.

**TEXAS STATE.**—The extension of this road from Rusk, Tex., west to a connection with the International & Great Northern at Palestine, 30 miles, has been finished and is now open for service. (March 16, p. 658.)

**TUCUMCARI & MEMPHIS.**—See Chicago, Rock Island & Gulf.

**UNITED RAILWAYS CO. OF ST. LOUIS.**—Work is now under way reconstructing about 30 miles of the line, laying 112-lb. rails on white oak ties in solid concrete.

**VANCOUVER TRACTION.**—Work is said to have been started on the Clark County Suburban, organized to build six miles from Vancouver, Wash., northeast to a point two miles east of Orchards. The work includes an 800-ft. pile bridge over Burnt Bridge creek. It is expected to have the line in operation by November 1.

**WASHINGTON, SPAR SPRING & GRETGA (ELECTRIC).**—This company is building 10 miles of line from Fifteenth and H streets, Washington, D. C., northeast to Berwyn Heights, Md.

**WESTMORELAND.**—Incorporated in Texas, with \$40,000 capital and office at Houston, Tex., to build five miles of line between Houston and Bellair, in Harris county, also to put up a union station. The incorporators include: W. W. Baldwin and Max Eggert, of Burlington, Iowa; A. J. Condit, R. B. Henderson and W. G. Sears.

**WINSTON-SALEM-SOUTHBOND.**—Contracts are said to have been let recently to build this line from Winston-Salem, N. C., south to Wadesboro, about 90 miles, as follows: Rinehart & Dennis, Washington, D. C.; Nave Brothers Co., Portsmouth, Ohio; The Ryan Co., Portsmouth, Ohio; The J. T. McKinney Construction Co., Lynchburg, Va.; Luck Construction Co., Roanoke, Va.; Ferguson Construction Co., New York; The Walton Co., Falls Mills, Va.; McCurdy Construction Co., Marion, N. C.; J. R. McDowell & Co., Knoxville, Tenn.; J. T. Bennett, Danville, Va. Work on the long steel viaduct across Salem creek has been in progress for about two weeks by the Pennsylvania Bridge Co. It is expected that the grading and masonry will be completed and the bridges erected by June, 1910. O. H. P. Cornell, chief engineer, Winston-Salem. (Aug. 6, p. 259.)

Among the provisions of the treaty recently concluded between England and Siam is an agreement on the part of Siam to build part of a railway to connect Singapore and Bangkok. Siam is to build only that part which will be in Siamese territory, and England is to lend the money needed to build the line.

## Railroad Financial News.

**ATCHISON, TOPEKA & SANTA FE.**—This company has secured trackage rights over the St. Louis & San Francisco from Brownwood, Tex., to Fort Worth, it is understood, and the St. Louis & San Francisco has been given trackage rights over the Santa Fe from Paris, Tex., to Dallas. According to press reports the agreements are to become effective September 1.

**BALTIMORE & OHIO.**—See Cincinnati, Hamilton & Dayton.

**BUFFALO, ROCHESTER & PITTSBURGH.**—The New York Public Service Commission, Second district, has approved an equipment agreement under which the B. R. & P. is to issue \$580,000 series E 4½ per cent. equipment bonds and \$183,000 series F equipment bonds and about \$988,000 series G 4 per cent. equipment bonds, the total being the entire cost of 1,000 new coal cars and 1,000 new box cars.

**CANADIAN PACIFIC.**—Alfred L. Baker & Co., Chicago, have published a very comprehensive circular analyzing the value of the common stock of the Canadian Pacific. Interesting comparisons are made of the operating efficiency and the earnings of the Canadian Pacific and other roads operating in the Northwest.

**CENTRAL NEW ENGLAND.**—See an item in regard to this company under State Commissions.

**CHARLOTTE, MONROE & COLUMBIA.**—The trustee of \$70,000 mortgage bonds has applied for a receiver. The road runs from McBee, S. C., to Jefferson, 22 miles.

**CINCINNATI, HAMILTON & DAYTON.**—The payment of over-due coupons and the exchange of securities for new bonds has begun under the plan of reorganization by which the Baltimore & Ohio is to acquire an option on the common stock of the C., H. & D., now held by J. P. Morgan & Co., New York, and in return is to guarantee bonds of the Cincinnati, Hamilton & Dayton. (June 4, p. 1188.)

The following have been elected directors: Oscar G. Murray, L. F. Loree, Samuel Rea, George F. Randolph, George M. Shriver and William Cotter. Mr. Murray was elected chairman of the board, and Mr. Cotter was elected president.

**MOBILE, JACKSON & KANSAS CITY.**—The property of this company is to be sold under foreclosure at Mobile on August 23, and it is understood that when bid in the property will be turned over to the successor company, the New Orleans, Mobile & Chicago.

**NEW ORLEANS, MOBILE & CHICAGO.**—See Mobile, Jackson & Kansas City.

**NEW YORK, NEW HAVEN & HARTFORD.**—The New York, Westchester & Boston and the New York & Portchester, control of both of which is held by the New York, New Haven & Hartford, have asked the New York Public Service Commission, Second district, for permission to consolidate the two corporations under the name of the New York, Westchester & Boston. The N. Y., W. & B. also asks permission to increase its capital stock from \$4,000,000 to \$20,000,000. The two companies, financed by the New Haven, are building a four-track electric road from One Hundred and Seventy-seventh street, New York, to a point on Long Island Sound, with a branch to White Plains. (March 12, p. 526.)

See an item in regard to the refusal of the Public Service Commission to assent to the plan for readjusting the finances of the Central New England proposed by this company under State Commissions.

**ST. LOUIS & SAN FRANCISCO.**—See Atchison, Topeka & Santa Fe.

**UNION PACIFIC.**—The *Commercial and Financial Chronicle*, New York, says that it is generally understood the Union Pacific has sold in recent weeks its entire holdings of Great Northern ore certificates. On June 30, 1908, the Union Pacific owned 77,164 of these shares. It is said on the New York Stock Exchange that part of the cash received from the sale of these certificates has been used to increase the Union Pacific's holdings of New York Central & Hudson River stock.

## Equipment and Supplies.

### LOCOMOTIVE BUILDING.

The Alabama Great Southern has ordered 14 consolidation, 5 Pacific and one Mallet compound locomotives from the Baldwin Locomotive Works, as mentioned in the *Railroad Age Gazette* of July 9. Delivery is set for September 20.

#### General Dimensions.

Type of locomotive	Consolidation
Weight on drivers	180,000 lbs.
Total weight	200,000 "
Weight of tender	146,000 "
Cylinders	22 in. x 30 in.
Diameter of drivers	56 "
Diameter of truck wheels	33 "
Boiler, type	Straight top
working steam pressure	200 lbs.
staying	Radial, Tate stay bolts
Heating surface, tubes	3,374 sq. ft.
Heating surface, firebox	143 "
Tubes, number	403
outside diameter	2 in.
length	14 ft. 6 1/4 "
Firebox, type	Wide
length	108 in.
width	71 3/4 "
Grate area	53 sq. ft.
Water capacity	7,500 gals.
Coal capacity	12 1/2 tons

#### General Dimensions.

Type of locomotive	Pacific
Weight on drivers	133,800 lbs.
total	217,575 "
tender	144,000 "
Cylinders	22 in. x 28 in.
Diameter of drivers	72 in. on 3 locomotives;
" " trailers	62 in. on 2 locomotives
" " truck wheels	42 in.
Boiler, type	Wagon top
working steam pressure	220 lbs.
staying	Radial, Tate stay bolts
Heating surface, tubes	3,700 sq. ft.
Heating surface, firebox	167 "
Tubes, number	314
outside diameter	2 1/4 in.
length	20 ft.
Firebox, type	Wide
length	109 1/4 in.
width	73 "
Grate area	54 sq. ft.
Water capacity	8,000 gals.
Coal capacity	12 1/2 tons

#### General Dimensions.

Type of locomotive	Mallet compound
Weight on drivers	332,000 lbs.
Total weight	352,000 "
Diameter of cylinders, H. P.	23 in.
Diameter of cylinders, L. P.	35 "
Stroke of pistons	32 "
Diameter of drivers	56 "
Type of boiler	Straight top
Working steam pressure	200 lbs.
Heating surface, tubes	5,384 sq. ft.
firebox	225 "
total	5,609 "
Tubes, number	437
outside diameter	2 1/4 in.
length	21 ft.
Firebox, type	Wide
length	117 in.
width	96 in.
material and maker	Worth Bros.
Grate area	78 sq. ft.
Tank capacity for water	9,000 gals.
Coal capacity	12 1/2 tons

#### Special Equipment.

Axles	Open-hearth steel
Bell ringer	W. R. E. Co.
Boiler lagging	Carey
Brakes	Westinghouse
Brake-beams	I-beam
Brake-shoes	Perfecto
Couplers	Tower on Mallet; Climax on others
Driving boxes	O.-h. steel on Pacific; cast-steel on others
Headlight	Pyle-National on Pacific; Schroeder on others
Injector	Hancock
Journal bearings	Ajax
Piston and valve-rod packing	Jerome
Safety valve	Ashton
Sanding device	Potts
Sight-feed lubricators	Nathan
Springs	Standard Steel Works
Staying	Tate
Steam gages	Ashton
Tires	Standard
Valve gear	Walschaerts
Wheel centers	Cast steel

The consolidations and the Mallet are also fitted with Franklin fire doors and Elvin grease cellars.

The Chicago, Milwaukee & St. Paul will build 25 locomotives at its own shops.

The Idaho & Washington Northern has ordered one locomotive from the Baldwin Locomotive Works.

The Rock Island Southern has ordered one six-wheel switch engine from the Baldwin Locomotive Works.

The Shannon Arizona Railway has ordered one consolidation locomotive from the Baldwin Locomotive Works.

The Pacific Portland Cement Co. has ordered one six-wheel switch engine from the Baldwin Locomotive Works.

The Central of Hayti is said to have ordered six locomotives from the H. K. Porter Co. This is not confirmed.

The Lake Superior Terminal & Transfer Co. has ordered one eight-wheel switch engine from the Baldwin Locomotive Works.

The Newburgh & South Shore has ordered from the Baldwin Locomotive Works one simple six-wheel switch engine for September delivery.

The Baltimore & Ohio, as mentioned in the *Railroad Age Gazette* of July 23, is in the market for 60 steam locomotives and two electric locomotives.

The Northern Pacific, as mentioned in the *Railroad Age Gazette* of August 13, has ordered 17 Pacific locomotives from the Baldwin Locomotive Works.

The Chicago, Burlington & Quincy, as mentioned in the *Railroad Age Gazette* of August 13, has ordered five Mallet compounds from the Baldwin Locomotive Works.

The Missouri, Oklahoma & Gulf has ordered two consolidation engines from the Baldwin Locomotive Works instead of one, as reported in the *Railroad Age Gazette* of August 6.

The Great Northern, as mentioned in the *Railroad Age Gazette* of August 13, has ordered 25 ten-wheel passenger locomotives and 10 Mallet compounds from the Baldwin Locomotive Works.

### CAR BUILDING.

The Texas Southeastern will order 50 thirty-ton flat cars.

The Union Railroad has ordered 400 steel underframe box cars.

The Chesapeake & Ohio is having 100 box cars repaired by the Illinois Car Co., Urbana, Ohio.

The Atlantic Coast Line will soon ask bids on four 60-ft. coaches and four 60-ft. express cars.

The Pittsburgh & Lake Erie has ordered 50 steel 50-ton flat cars from the Pressed Steel Car Co.

The United Railways Company of St. Louis is converting cars into pay-as-you-enter type at its own shops.

The Chicago Great Western has ordered 1,500 steel underframe 40-ton box cars from the American Car & Foundry Co.

The Vincennes Traction Co., Vincennes, Ind., has ordered one motor car from the Dorner Railway Equipment Co., Chicago.

The Missouri, Oklahoma & Gulf has ordered from the Barney & Smith Car Co. two coaches, two chair cars and four caboose cars.

The Diamond Match Co., Chico, Cal., has ordered 25 forty-one-ft. flat cars of 40 tons capacity from the American Car & Foundry Co.

The Burghaw Traction Co., Burlington, N. C., has ordered six motor and six trail cars from the Dorner Railway Equipment Co., Chicago.

The Colorado & Southern has ordered for the Fort Worth & Denver City Railway two 60-ft. compartment coaches and two 60-ft. baggage cars.

The Ann Arbor has ordered the 500 flat bottom drop 50-ton



coal cars mentioned in the *Railroad Age Gazette* of July 2 from the Standard Steel Car Co.

The *Chicago & North Western* is about to order 50 passenger cars in addition to the 96 which were ordered from the Pullman Company two months ago.

The *Nashville, Chattanooga & St. Louis* has ordered 100 steel underframe 40-ton box cars from the American Car & Foundry Co., for September delivery.

The *Temiskaming & Northern Ontario Railway Commission* has ordered a private car from the Preston Car & Coach Co., for delivery about the end of October.

The *Spokane, Portland & Seattle* is building 10 cabooses in Vancouver, Wash., in compliance with a recent state law requiring all cabooses to have two trucks.

The *Grand Trunk Pacific* is said to have ordered 200 stock cars, 700 box cars, 300 flat cars and 200 refrigerator cars from the Canada Car Co. This is not yet confirmed.

The *Kansas City Railway & Light Co.* has ordered the 25 trail cars mentioned in the *Railroad Age Gazette* of August 12 from the McGuire-Cummings Manufacturing Co.

The *Bellingham Bay & British Columbia* is assembling material for 10 flat cars of 35 tons capacity, to be built at its own shops. Most of the material has been delivered.

The *Chicago, Burlington & Quincy*, reported in the *Railroad Age Gazette* of August 6 as in the market for 500 flat cars, has ordered this equipment from the American Car & Foundry Co.

The *Illinois Traction System* has ordered 10 pay-as-you-enter cars from the Danville Car Co. for its Champaign lines. The company has also ordered 50 forty-ton coal cars from the American Car & Foundry Co.

The *Louisville Railway*, Louisville, Ky., has ordered 33 pairs of trucks from the Baldwin Locomotive Works to be put under the bodies ordered some time ago, as mentioned in the *Railroad Age Gazette* of August 6.

The *Chicago, Rock Island & Pacific* has ordered the 2,000 cars mentioned in the *Railroad Age Gazette* of August 13 as follows: Western Steel Car & Foundry Co., 1,000; Standard Steel Car Co., 500; American Car & Foundry Co., 500.

The *Harriman Lines* are in the market for 70 all-steel coaches, three dining cars and two observation cars. The order will probably be given to the Pullman Company as an increase of the order reported in the *Railroad Age Gazette* of July 16.

The *Alabama Great Southern* has ordered 10 coaches from the Pullman Company and 3 postal and 2 baggage cars from the American Car & Foundry Co., as previously reported in the *Railroad Age Gazette*. All the cars have wood bodies and steel underframes. The coaches are 66 ft. long and 9 ft. 8 in. wide, over sills, and have a seating capacity of 84. The baggage and postal cars are 60 ft. long and 9 ft. wide, inside measurements. The special equipment for all cars is as follows:

Axles .....	Open-hearth steel
Bolsters .....	Steel
Brakes .....	Westinghouse
Brake-beams .....	National Hollow
Brake-shoes .....	Am. Brake-Shoe & Fdry Co.
Brasses .....	M. C. B. lead lined, on coaches; Ajax, on baggage and postal
Couplers .....	Buhoup 3 stem
Curtain fixtures .....	Curtain Supply Co., on coaches
Curtain material .....	Pantasote, on coaches
Draft gear .....	Miner tandem
Dust guards .....	Harrison
Heating system .....	Ward
Journal boxes .....	Franklin
Lighting system .....	Electric
Paint .....	Sherwin-Williams
Platforms .....	Steel (part of underframes)
Seat covering .....	Plush, on coaches
Side bearings .....	Woods
Springs .....	Railway Steel-Spring Co., on coaches Standard Steel Works, on others
Trucks .....	Commonwealth steel
Vestibules .....	Pullman standard on coaches
Vestibule diaphragms .....	Ajax canvas
Vestibule trap doors .....	Edwards, on coaches
Wheels .....	36-in. Standard Steel Works, rolled 3-in. tire
Window fixtures .....	Edwards on coaches.

The *Baltimore & Ohio* has ordered 1,000 all-steel, 50-ton, coke cars from the Cambria Steel Co.; 45 coaches and five

combination passenger and baggage cars from the American Car & Foundry Co.; 10 baggage cars, five cafe and parlor cars and five all-steel postal cars from the Barney & Smith Car Co. The passenger cars which are not all steel will have steel underframes. The company is in the market for 1,000 box cars, 500 refrigerator cars and 500 ventilated box cars.

#### IRON AND STEEL.

The *Gould Lines* have ordered 20,000 tons of rails.

The *Chicago Great Western* has ordered 10,000 tons of rails.

The *Chicago & Alton* has ordered 1,000 tons of rails from the Lackawanna Steel Co.

The *Central of Hayti* is said to have ordered 1,200 tons of rails from the Carnegie Steel Co.

The *Chicago, Burlington & Quincy* has ordered the 5,000 tons of rails for which it was reported in the market last week.

The *Baltimore & Ohio* has ordered 27,250 tons of rails as follows: Two thousand tons, open hearth, Bethlehem Steel Co.; 3,000 tons, open hearth, Indiana Steel Co.; 12,000 tons, Bessemer, Carnegie Steel Co., and 10,250 tons, Bessemer, Maryland Steel Co.

*General Conditions in Steel.*—The market continues strong. Large orders for rails and cars were placed last week and the prospect for further business is promising. Structural steel deliveries in the East are reported as being three months behind. The prices of iron have increased and the movement of ore during August will probably be record-breaking. The Steel Corporation has opened its books for rail orders for 1910 delivery.

#### RAILROAD STRUCTURES.

CANON CITY, COLO.—According to press reports the Denver & Rio Grande is soon to begin work on a \$50,000 passenger station.

CEDAR RAPIDS, IOWA.—The Cedar Rapids & Iowa City Railway & Light Co. has let contracts for power house improvements to cost \$125,000. A feature of the work is a concrete smoke-stack 210 ft. high, with an inside diameter of 16 ft. at the base and 10 ft. at the top.

CHEHALIS, WASH.—The Northern Pacific will build a brick passenger station and convert the present structure into a freight house.

CITICO, TENN.—The Southern Railway is building a small blacksmith shop to repair frogs, switches and roadway tools.

COLUMBUS, OHIO.—According to press reports a contract has been given to Carr & Sons, contractors, of Indiana, by the Cleveland, Cincinnati, Chicago & St. Louis, to put up new freight houses at a cost of about \$150,000.

COVINGTON, KY.—It is reported that the Louisville & Nashville and the Chesapeake & Ohio are to build the new passenger station jointly. Earlier information was to the effect that the Chesapeake & Ohio was to build it alone, as mentioned in the *Railroad Age Gazette* of July 16. The estimated cost of the building is \$40,000.

CRANE, MO.—The St. Louis, Iron Mountain & Southern has almost completed its freight terminal yards, the roundhouse, oil house and coaling station being now complete. The cost of the work is estimated at \$200,000.

ESCANABA, MICH.—The Chicago & North Western expects to build a new dock for handling ore. The contract for clearing the site is reported to have been let.

GRAND ISLAND, NEB.—The Union Pacific is to enlarge its terminals and build a freight house. The city has closed two streets to provide room for the new freight house.

HAZELTON, OHIO.—An officer of the Pittsburgh & Lake Erie writes that there is no truth in the recent reports that it has been decided to abandon the shops at McKee's Rocks, Pa., and



establish new ones at Hazelton, near Youngstown, Ohio (Aug. 13, p. 300.)

HOUSTON, TEX.—The International & Great Northern is to build a 600-ft. wharf on the ship channel with loading and unloading tracks and a storage shed 400 ft. x 50 ft.

An officer of the Missouri, Kansas & Texas writes that work has been begun on yard improvements, and that the freight house is to be reconstructed with enlarged offices, at an estimated cost of \$100,000. The engineering department is in direct charge of the work and most of it will be done by company forces.

JACKSBORO, TEX.—The Gulf, Texas & Western is having plans made for a combined freight and passenger station.

KANSAS CITY, MO.—An officer of the Kansas City Terminal Ry. Co. writes that there is no truth in the report that his company is to build a bridge over the Missouri river. A bridge is to be built, however, for an electric company that has recently been financed to build to Excelsior Springs. The bridge, which will be reinforced concrete arches, is to rest on piers which were put in over 25 years ago for a bridge to carry a proposed road, the Chicago & Atlantic, which failed financially after a small amount of work had been finished.

LOUISVILLE, KY.—According to press reports final plans for the construction of a union station at Seventh street to replace the structure destroyed by fire, have been made. Contracts between five railways to jointly use the structure, it is said, have been agreed upon recently and plans are now being made by the Illinois Central to start the work at once.

MEMPHIS, TENN.—The City Council has passed an ordinance requiring all railways entering the city to undertake extensive terminal improvements, including elevation or depression of tracks and the construction of necessary viaducts and subways.

NELSON, B. C.—The Canadian Pacific car repair shop was totally destroyed by fire August 7, four cars of merchandise being included in the loss. Press reports give the loss as \$10,000.

NEW YORK.—The application of the receivers of the Metropolitan Street Railway Company to make improvements has been upheld by the courts and additional repairs are to be made to the car houses at a cost of \$344,205. The repairs to the Lenox avenue car house will cost \$73,140; Ninth avenue and Fifty-third street, \$270,658, and Fourth avenue and Thirty-third street, \$407.

OTHELLO, WASH.—The Chicago, Milwaukee & Puget Sound has completed its new station and begun work on its freight sheds.

PERKIOMEN JUNCTION, PA.—According to press reports the Philadelphia & Reading has given contracts to the McClintic-Marshall Construction Co., of Pittsburgh, Pa., for putting up nine steel bridges, and to the Phoenix Bridge Co. for nine steel bridges. All the bridges are small, aggregating about 1,000 ft., and are being put in to replace the present wooden structures on the Perkiomen branch.

PHILADELPHIA, PA.—Bids are wanted August 24 by G. R. Stearns, of the Bureau of Surveys, Philadelphia, for a 63-ft. 9-in. span, reinforced concrete arch bridge, 80 ft. wide, to be built over the West Chester & Philadelphia Railroad.

PLYMOUTH, N. H.—According to press reports the Boston & Maine has decided upon the plans for a station to cost \$50,000, to replace the structure destroyed by fire early this year.

QUEBEC, QUE.—The Trans-Continental Railway Commission is said to have bought 30 acres of land as a site for shops and yards at St. Perpetue L'Islet county at a point three miles north of St. Perpetue. A repair shop is also to be built at Baker lake, Robinson canton, Temiscouata county, on the Quebec-New Brunswick boundary, about 45 miles from Edmundston, N. B.

ROANOKE, VA.—It is reported that the Winston-Salem South-bound, now under construction from Winston-Salem, N. C., south to Wadesboro, 90 miles, has let contracts for 11 bridges on its line to the Virginia Bridge & Iron Co., Roanoke, Va.

ROCKWOOD, TENN.—The Cincinnati, New Orleans & Texas Pacific will build a station.

ST. LOUIS, MO.—The Illinois Traction Co. plans to build a passenger station at Broadway and Salisbury streets, another in the vicinity of Fourth street and Washington avenue, and an express station at Twelfth street and Lucas avenue.

SHERMAN, TEX.—Contracts have been let for a new passenger station to be used jointly by the Texas & Pacific, the St. Louis & San Francisco, and the Houston & Texas Central. The station is to be modern in design and equipment and will cost about \$90,000.

SHREVEPORT, LA.—The Louisiana & Arkansas has completed plans for freight and passenger stations.

SPRINGFIELD, OHIO.—Work, it is said, will be started soon by the Ohio Electric Railway on a station to be built at Fountain avenue and Columbia street, at a cost of \$50,000.

TAYLOR, TEX.—The International & Great Northern has secured a source of water supply for its new shops which promises to be economical in an unusual degree. The company has leased 30 acres of land on which there is a number of springs located at an elevation of some 50 ft. above the level of the shops. A dam is to be built soon to form a reservoir on the tract and the water will be piped down to the shops without pumping.

TOPEKA, KAN.—The Atchison, Topeka & Santa Fe has let the contract for building oil and supply houses at its shops. The estimated cost of the work is \$60,000.

UTICA, N. Y.—The New York Public Service Commission, Second district, has approved the plans for the elimination of grade crossings on the New York Central & Hudson River at Genesee street, and the work can now be started. The cost of the improvements will be \$370,000.

VANCOUVER, B. C.—According to press reports plans are being made by the Grand Trunk Pacific to have terminals in Vancouver, to be used jointly with the Great Northern and the Northern Pacific.

VIRGINIA, MINN.—The Virginia & Rainy Lake has completed its new shops and the machinery is now being installed.

WICHITA FALLS, TEX.—The Wichita Falls & Northwestern's bridge over the Red river was destroyed by fire.

WILMINGTON, DEL.—At a recent meeting of the City Council an ordinance was introduced to carry out the agreement between the city of Wilmington and the Baltimore & Ohio. This action insures the construction of the new B. & O. bridge over the Brandywine creek. The new structure is to have eight piers and is to be 115 ft. high, 764 ft. long and 33 ft. wide. The cost of the improvements will be about \$500,000. (July 16, p. 129.)

YOUNGSTOWN, OHIO.—The Pennsylvania will build an addition to its freight house to cost about \$25,000.

#### SIGNALING.

The Rock Island has rebuilt the mechanical interlocking plant at 61st street, Chicago, in connection with the change in running from left to right-hand by the Lake Shore. This is a National machine and as rebuilt has 32 working levers in a 32 lever frame, as follows: 3 levers for five high signal arms, 11 levers for 11 dwarf signals, 18 levers for 14 switches and derails, 1 movable frog, 10 facing point locks and 3 bolt locks for hand thrown switches. The high signals are power operated, giving indications in the upper right-hand quadrant. They are style "S," as made by the Union Switch & Signal Co. On each high signal post is a dwarf "calling-on" arm. The calling-on arms and other dwarf signals are wire-connected and work to 45 degrees only.

The Madeira-Marmora Railway of Brazil is now completed for about 57 miles. This line, which is being built by the government, connects the Madeira and Marmora rivers, and thus makes a line of transportation around the falls, which have been a barrier in the route from Bolivia to the Atlantic ocean.

## Supply Trade News.

The Intercolonial Railway is about to ask bids for 28 iron working machine tools.

P. A. McCarthy & Sons, consulting civil engineers, will move their offices, about September 15, from Lufkin, Tex., and El Paso, to Houston.

J. V. Westcott, resident engineer of the Northern Pacific at Garrison, Mont., has taken a position in the Chicago office of the Q. & C. Company, New York.

The Pressed Steel Car Co., Pittsburgh, Pa., has resumed work at its McKee's Rocks plant and about 2,000 men are now employed regularly turning out cars.

Ralph W. Benson, engineer, Pullman Car Works, Chicago, has been appointed an assistant manager, sales department, of the Pullman Company, with office at Chicago, succeeding A. Twyman, retired.

The Frick Company, Waynesboro, Pa., has ordered a 16 in. x 24 in. saddle tank switching locomotive from the Vulcan Iron Works, Wilkes-Barre, Pa. This locomotive is now about completed.

The Boston Belting Co., Boston, Mass., recently made in one continuous length 1,170 ft. of its Forsyth braided hose. This is the longest continuous length of hose, it is said, which has ever been produced.

J. H. Burwell, New York, railway sales agent, representing the Seeger Refrigerator Co., St. Paul, Minn., and Edward Smith & Co., New York, has moved his office from 10 Wall street to the Singer building.

The Grip Nut Co., Chicago, has moved its offices from 1590 Old Colony building to 575 Old Colony building. This change has been made to give the company much larger quarters to take care of increased business.

Oscar F. Ostby, sales manager of the Commercial Acetylene Co., New York, was elected president of the International Acetylene Association at the annual convention at the Hotel Knickerbocker on August 11.

The Bettendorf Axle Co., Davenport, Iowa, is planning a 256-ft. x 1,400-ft. extension of the present main shop. The new part will be an erecting shop and the equipment will include several electric traveling cranes.

G. S. Turner, who recently left the position of general equipment inspector of the Southern Railway to represent the American Locomotive Sander Co., Philadelphia, Pa., has taken a position with the Crane Company, Chicago.

Universal window fixtures and Universal deck sash ratchets, made by the Grip Nut Co., Chicago, will be used on the 50 new passenger cars to be built by the American Car & Foundry Co. and the Barney & Smith Car Co. for the Baltimore & Ohio.

J. B. Rider, formerly general superintendent and assistant to the vice-president of the Pressed Steel Car Co., Pittsburgh, Pa., has been appointed general manager of that company. J. B. Maher has been appointed general agent in charge of the sales department.

George Brill, son of J. G. Brill, founder of the J. G. Brill Co., Philadelphia, Pa., has retired after 16 years' service. Mr. Brill is now making an extended European trip. He is succeeded by his son, B. O. Brill, who has been his assistant in the lumber department.

F. C. Armstead, supervising engineer of the stoker department of the Westinghouse Machine Co., Pittsburgh, Pa., who for a number of years has been located at East Pittsburgh, has moved his headquarters to the Westinghouse works at Attica, N. Y., where the stokers are manufactured.

H. W. Leeds, formerly assistant manager of the Santa Fe Refrigerator Despatch, has been made manager of the railway sales department of the Union Fibre Co., Winona, Minn. Mr. Leeds will sell Linofelt, the company's standard insula-

tion for refrigerator cars, and also its special steel car insulation for passenger coaches and other steel equipment.

The United Electric Co., Chambersburg, Pa., has ordered from the Ball & Wood Co., Elizabethport, N. J., two 750 k.w. Rateau-Smoot, high-pressure turbines and 60-cycle, three-phase generators, to be installed in its plant at Lemoyne, Pa. The United Electric Co. is owned by the Cumberland Valley Railroad. The specifications for the units just contracted for were issued by the motive power department of the Pennsylvania.

The Isthmian Canal Commission asks bids up to September 16 for the purchase of old iron and steel in the Canal Zone, consisting of abandoned locomotives, cars, structural steel, old machinery, etc. (Circular No. 529.) Bids are asked up to September 9 on one screw-cutting engine lathe, one punching and shearing machine, one extension vertical boring and turning mill, dies, lathe dogs, canvas and rubber belting and belt dressing. (Circular No. 531.)

The Westinghouse Storage Battery Co., which was incorporated July 12, has acquired all of the plant, patents and equipment of the storage battery department of the Westinghouse Machine Co. and of the General Storage Battery Co. and will manufacture, at Boonton, N. J., both the Westinghouse and Bijur types of storage battery for those classes of service in which each has proven superior. The new company will maintain thoroughly equipped testing and commercial laboratories, insuring uniformity of both materials and product. The general offices will be at Boonton, with sales offices in the principal cities of the country.

Preliminary returns of the Western Electric Co., Chicago, for July show that the company's business for that month ran approximately 46 per cent. ahead of July, 1908. The eight months' returns indicate a gross business for the year of about \$47,000,000, but it is expected that improvement in industrial conditions will enable the company to show nearer \$50,000,000 in round figures. For the year ending November 30 last, gross sales of the Western Electric totaled \$33,000,000. In 1907 the total was \$52,000,000 and in 1906, \$69,000,000, the last-named figure being the high record for the company. In electric lighting supplies and electrical machinery, last month was the largest in the Western Electric's history. The eight months also were the largest eight months on record in these two lines. Of late there has been considerable activity in the foreign departments.

William N. Patten, engineering manager of the Stone & Webster Engineering Corporation, Boston, Mass., has gone to the construction department of the company. Frederic N. Bushnell has succeeded him as engineering manager. Mr. Bushnell joined the staff of Stone & Webster in February, 1907, taking charge of the construction of the Lincoln, Harvard and Charlestown power stations of the Boston Elevated. This work consisted in substantially enlarging the structures of the three original stations and installing 20,000 h.p. of new generating capacity, with boilers and all other auxiliaries. It was carried out in the exceptionally short period of ten months. Previously, Mr. Bushnell was chief engineer of the Rhode Island Company, in charge of design and construction of power stations, substations, car barns, bridges, tracks, and also of operation of power stations. In connection with a large station designed and built under his supervision at Providence, there was conducted a service test which lasted an entire year and established a record for economical operation, which, it is believed, has rarely if ever been equalled in this country.

### TRADE PUBLICATIONS.

*Northern Pacific.*—The company's pamphlet on the train service on its four daily trains to the Pacific coast is a neat publication with illustrations in color and a five-color cover design. Diagrams of the dining, observation and sleeping cars in use, and schedules of the four trains are included.

*Pacific Coast Resorts.*—This is the latest publication of the passenger department of the Northern Pacific, and contains 80 pages of interesting facts and attractive pictures. A short history of the early expeditions into the north coast country



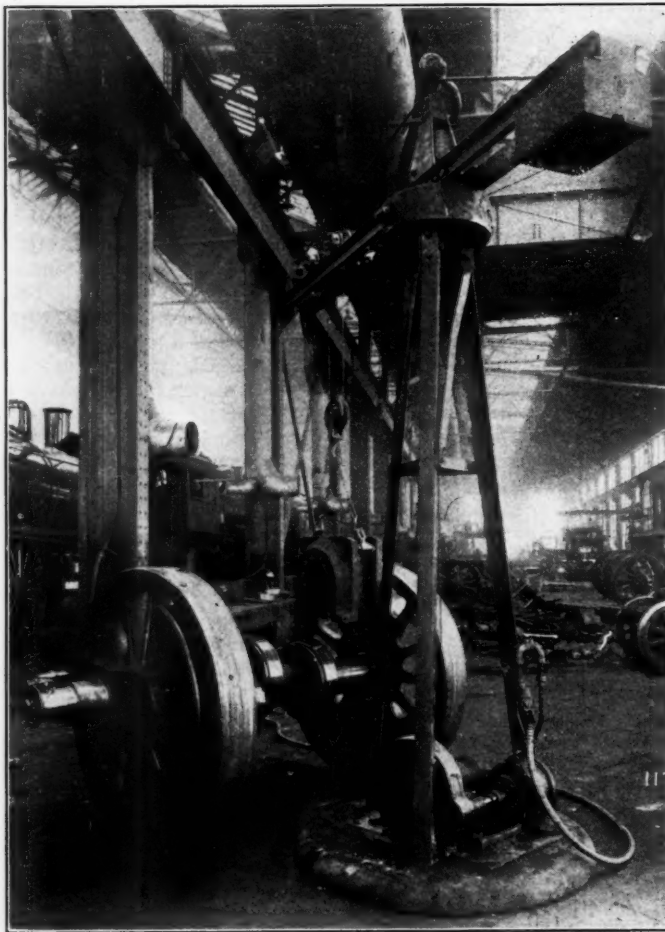
and of its later development are included. Portland, Tacoma, Seattle and Spokane are all illustrated and described, together with many picturesque spots near each of these points.

**Free Lands in Wyoming.**—The cover design is the keynote of this booklet, being a photograph of a "Wyoming Grain Exhibit." The Chicago & North Western has issued the publication as a guide to farmers desiring to take up homesteads in Wyoming. The Mondell and Carey homestead acts are given in brief and clearly explained. The possibilities of successful farming in the state are emphasized; the methods of dry farming, now largely used, are described; and illustrations and personal testimonials from farmers already located in Wyoming are given in proof of the statements made.

#### Portable Jib Crane.

The portable jib crane illustrated herewith was designed by a master mechanic and has been for some years in successful erecting shop service.

It may be quickly placed in any position on the floor by overhead



Portable Jib Crane.

traveler, and will handle loads without any manner of assistance from traveler. Not only is labor of men engaged on a given job rendered more efficient, but the time of traveling crane is conserved most effectively. The work handled by this crane in railway shops includes the removal and replacement of driving boxes, eccentric straps and eccentrics on driving axles. All work in connection with repairs to these parts, such as putting up the cellars, sponging boxes and bolting the eccentrics and eccentric straps, is done under the crane; and the driving wheels are then ready to place under the engine. One of these cranes will serve a shop handling 60 engines a month for average repairs, and, from actual experience, will save the labor of one mechanic and two helpers, amounting to about \$200 a month. Besides this economy, one-third the time of the traveling crane is available for other operations which could not be performed by one auxiliary crane. This crane can also be used advantageously in a locomotive boiler shop; for handling pneumatic gap riveters or staybolt breakers; in a machine shop for assembling tools; and for handling heavy vise work, etc.

The crane consists of a heavy base plate on which is a structural pillar with a swivel plate on top, on which the rotating jib is pivoted. A movable trolley supports a block and hook, a weight attached to the opposite end of jib balancing the trolley and part of the load. The jib is stayed by tension rods, and the strut for these contains eye bolts for the clevis loop by which the crane is lifted and transported by overhead traveler.

The hoisting gearing is attached to the base plate or the structural pillar, and is operated by pneumatic, electric motor or hand power. Swinging and trolley travel are operated by hand power. Capacities range from 1,000 lbs. to 2 tons, and the effective radius of the crane is about 10 ft.

The special features of construction are fully covered by United States patents. The cranes are manufactured exclusively by the Whiting Foundry Equipment Co., Harvey, Ill.

#### Ryerson Rotary Squaring Shear.

There has long been a demand for a low-priced squaring shear—one that can be conveniently installed in any sheet metal shop, cornice shop, hardware store or tinshop, without the investment of the several hundred dollars representing the cost of the double-housing machine, and of sufficient width to handle the general range of work. The amount of shearing done in the average shop is not sufficient to justify the expenditure of very much money for a suitable machine, hence the small shop has largely depended on the use of the ordinary hand shears, despite the effort in cutting the heavier gages, and the choppy edges resulting.

The Ryerson rotary squaring shear is designated to shear a sheet 10 ft. long of any width and of any thickness up to and including No. 20 gage. The shearing is done by small, circular, tool steel blades mounted in a cutting carriage. This carriage is connected by a band of strip steel to a drum which is turned by a series of gears operated by a hand lever. Turning this lever winds the piece of strip steel on the drum, thus dragging the blades through the shear. The blades rotate in opposite directions, facilitating the cutting and reducing the power required. The metal is held stationary during the cutting by the top section of the machine, which is clamped securely down on it.

The machine works equally well when merely shaving the edge of the metal or when making a long cut through the body of the sheet. The alignment of the cutters is exact, leaving a true straight edge in cutting, without burr or unevenness of any kind.

The machine weighs only 200 lbs., and can be fastened to any ordinary work table or bench by clamps, as shown in the illustration. Because of its light weight it can be taken to outside work, thus saving time by doing away with considerable hand labor or the necessity of having all the material cut before it is sent to the job. It is provided with an adjustable gage for use when cutting sheets on a bias. Joseph T. Ryerson & Son, Chicago, are the makers.



Ryerson Rotary Squaring Shear.